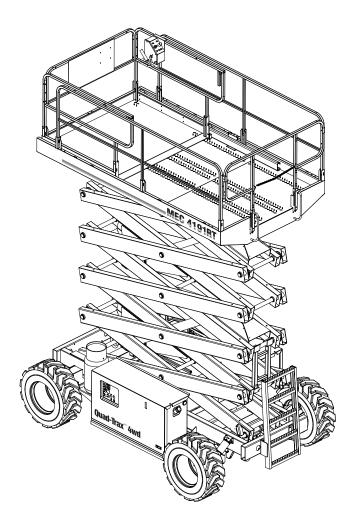


SERVICE AND PARTS MANUAL

2591RT / 3391RT / 4191RT



Serial Number Range 2591RT - 9401000 - Present 3391RT - 9501000 - Present 4191RT - 9601000 - Present

Part # 91495 R1 Issued October 2008

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Pages	Reason for update
V VI	Introduction Update Specifications Table Update Illustration
2-3	Section 2 Update illustration: Deutsch Connectors
4-11	Section 4 Update Step 3:Setting Counterbalance Valves
5-15	Section 5 Update illustration: Outrigger Electric Schematic
C-2 C-3 C-4 C-5 C-6 C-7	Section C Update illustration: Scissor Assembly - 2591RT Update parts list: Scissor Assembly - 2591RT Update illustration: Scissor Assembly - 3391RT Update parts list: Scissor Assembly - 3391RT Update illustration: Scissor Assembly - 4191RT Update parts list: Scissor Assembly - 4191RT
D-2 D-4 D-5	Section D Update illustration: Rear Axle Assembly Update illustration: Rear Axle Assembly Update parts list: Rear Axle Assembly
F-2 F-3 F-5 F-16 F-18 F-19 F-20 F-22 F-23	Section F Update illustration: Base Assembly Update parts list: Base Assembly Update parts list: Control Module Update illustration: Dual Fuel Engine, Kubota DF752 Update illustration: Dual Fuel Engine, Kubota DF752 Update parts list: Dual Fuel Engine, Kubota DF752 Update illustration: Diesel Engine, Kubota D1105 Update illustration: Diesel Engine, Kubota D1105 Update parts list: Diesel Engine, Kubota D1105
G-4 G-5	Section G Update illustration: Decals, Base Assembly Update parts list: Decals, Base Assembly



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Table of ContentsService Manual

INTRODUCTION	I
General Safety Tips	III
Hydraulic System	IV
Electrical System	
Total System	IV
Machine Specifications	V
Primary Machine Components	VII

SECTION 1:

HYDRAULIC SYSTEM	1-1
Hydraulic System - General	
Hydraulic Fluid	
Hydraulic Fluid Reservoir	
Hydraulic Pump	1-7
Wheel Drive	1-7
Parking Brake and Towing Circuit	1-14
Emergency Systems And Procedures	1-15
Steering Circuit	1-16
Platform Lift Circuit	1-18
Optional Outriggers	1-20
Cylinder Repair	1-21
Hydraulic Manifold	1-24



Table of Contents

SECTION 2:	
ELECTRICAL SYSTEM	2-1
Electrical System - General	
Deutsch Connectors	
Battery	
Battery Preventative Maintenance:	
Battery Replacement	
Alarms and Switches	
Tilt Alarm	
Relays	
Limit Switch	
Optional Outriggers Switches	
Continuity Checks	
-	

SECTION 3:

MECHANICAL COMPONENTS	3-1
Torque Specifications	3-2
Mechanical Components	
Base/ Undercarriage	3-3
Raising the Machine	
Tires	3-4
Drive Motors	3-5
Steer Cylinder	3-6
Hoses and Cables	3-7
Platform Removal	3-7
Lift Cylinder Removal and Installation	3-8
Scissor Beam Assembly	
Engine Maintenance	
Diesel Engine	3-9
Gasoline and Dual Fuel Engine	3-12
Outrigger Function	
Outrigger Calibration	3-15
GP106 Outrigger Control Module Troubleshooting	
Outrigger Module GP106 LED Flash Codes	3-18



Table of Contents

SECTION 4:	
TROUBLESHOOTING	
Troubleshooting	4-3
General Troubleshooting Tips	4-3
Common Causes of Hydraulic System Malfunctions:	4-3
Hydraulic Pressure Adjustment Procedures	4-9
Proportional Speed Adjustment	4-12
Controls and Switches	4-14

SECTION 5:

SCHEMATICS	5-1
Hydraulic Schematic	
Main Hydraulic Manifold	
Optional Outriggers Hydraulic Manifold	5-5
Electric Schematics	
Circuit Board	5-8
Controls	5-10
Engine	5-13
Optional Outriggers	5-15
Optional Generator	5-16



Table of Contents Parts Manual

SECTION A: CONTROL BOXES SECTION B: PLATFORM AND RAILS SECTION C: SCISSORS SECTION D: AXLES SECTION E: HYDRAULICS SECTION F: BASE SECTION G: DECALS



INTRODUCTION

This manual consists of Service and Parts illustrations sections.

The Service Section of this manual is designed to provide you, the customer, with the instructions needed to properly maintain the MEC self-propelled scissors lift. When used in conjunction with the illustrated parts section and the Operators Manual (provided separately), this manual will assist you in making necessary adjustments, repairs, identifying, and ordering the correct replacement parts.

All parts represented here are manufactured and supplied in accordance with MEC's quality standards.

We recommend that you use Genuine MEC parts to insure proper OPERATION and reliable PERFORMANCE.

To obtain maximum benefits from your MEC scissors lift, always follow the proper operating and maintenance procedures. Only trained authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operator's, Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs.

To help you recognize important safety information, we have identified warnings and instructions that directly impact on safety with the following signals:



"DANGER" INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS SIGNAL WORD IS LIMITED TO THE MOST EXTREME SITUATIONS.



"WARNING" INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.



"CAUTION" INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY. IT MAY ALSO BE USED TO ALERT AGAINST UNSAFE PRACTICES. "CAUTION" IS USED FOR PROPERTY-DAMAGE ONLY ACCIDENTS.



NOTE: The best method to protect yourself and others from injury or death is to use common sense. If you are unsure of any operation, <u>don't start</u> until you are satisfied that it is safe to proceed and have discussed the situation with your supervisor.

Service personnel and machine operators must understand and comply with all warnings and instructional decals on the body of the machine, at the ground controls, and platform control console.



MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN AND SPECIFICATIONS WITHOUT WRITTEN PERMISSION FROM MEC ARE STRICTLY FORBIDDEN. A MODIFICATION MAY COMPROMISE THE SAFETY OF THE MACHINE, SUBJECTING OPERATOR(S) TO SERIOUS INJURY OR DEATH.

MEC's policies and procedures demonstrate our commitment to Quality and our relentless ongoing efforts towards Continuous Improvement, due to which product specifications are subject to change without notice.

Any procedures not found within this manual must be evaluated by the individual to assure oneself that they are "proper and safe."

Your MEC Scissors Lift has been designed, built, and tested to provide many years of safe, dependable service. Only trained, authorized personnel should be allowed to operate or service the machine.

MEC, As Manufacturer, Has No Direct Control Over Machine Application And Operation. Proper Safety Practices Are The Responsibility Of The User And All Operating Personnel.

If There Is A Question On Application And/Or Operation Contact:

mec

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GENERAL SAFETY TIPS

Regular inspection and conscientious maintenance is the key to efficient economical operation of your scissors lift. It will help to assure that your equipment will perform satisfactorily with a minimum of service and repair.

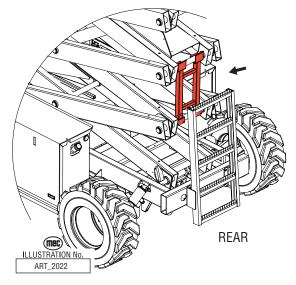
The actual operating environment of the machine governs the inspection schedule. Correct lubrication is an essential part of the preventative maintenance to minimize wear on working parts and ensure against premature failure. By maintaining correct lubrication, the possibility of mechanical failure and resulting downtime is reduced to a minimum.



NEVER PERFORM SERVICE ON THE MACHINE (WITH THE PLATFORM ELEVATED) WITHOUT FIRST BLOCKING THE BEAMS (SCISSORS) ASSEMBLY IN PLACE USING THE MAINTENANCE LOCK!

- Block scissors assembly using Maintenance Lock if machine is in the elevated/extended position.
- Never leave hydraulic components or hoses open. They must be protected from contamination (including rain) at all times.
- Never open a hydraulic system when there are contaminants in the air.
- Always clean the surrounding area before opening hydraulic systems.
- Use only recommended lubricants. Improper lubricants or incompatible lubricants may be as harmful as no lubrication.
- Watch for makeshift "fixes" which can jeopardize safety as well as lead to more costly repair.

Maintenance Lock In Position





Hydraulic System



HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY, BLINDNESS, AND EVEN DEATH. CORRECT LEAKS IMMEDIATELY.



Hydraulic fluid leaks under pressure may not always be visible. Check for pin hole leaks with a piece of cardboard, not your hand.

Electrical System



Prevent damage to battery and/or electrical system;

- Always disconnect the negative battery cable first.
- Always connect the positive battery cable first.

If contact is made between the positive side of the battery and a metal surface on the machine when the negative cable is installed a spark will occur. This can cause damage to the electrical system, battery explosion, and personal injury.

Total System



Engine coolant level must be checked only after engine has cooled. If radiator cap is removed while the coolant is at normal operating temperature, pressure within the coolant system will force hot liquid out through the filler opening and possibly cause severe scalding.

Failure to perform preventive maintenance at recommended intervals may result in the unit being operated with a defect that could result in injury or death of the operator.

Immediately report to your supervisor any Defect or malfunction. Any defect shall be repaired prior to continued use of the scissors lift.

Inspection and maintenance should be performed by qualified personnel familiar with the equipment.

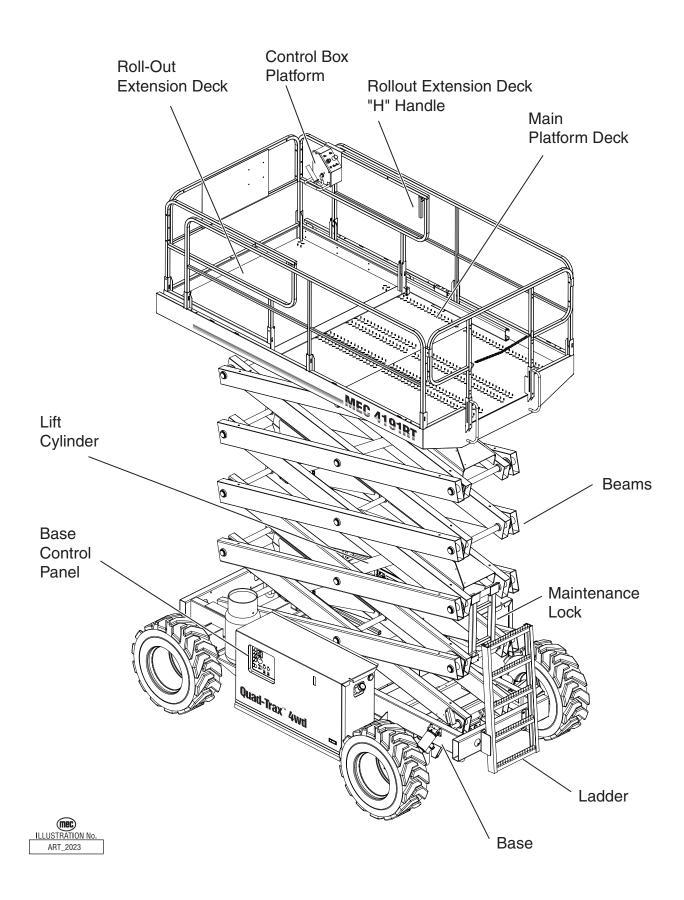


MACHINE SPECIFICATIONS

	2591RT		3391RT		4191RT	
Working Height*	31 FT*	9.62 m*	39 FT*	12.06 m*	47 FT*	14.50 m*
Platform Height	25 FT	7.62 m	33 FT	10.06 m	41 FT	12.50 m
Platform Entry Height	57 IN	1.45 m	66 IN	1.67 m	74 IN	1.88 m
Stowed Height Rails Up	100.5 IN	2.55 m	109.5 IN	2.78 m	119 IN	3.02 m
Rails Folded Down	71 IN	1.80 m	79 IN	2.01 m	87.5 IN	2.22 m
Maximum Number of Occupants	5	5	4	4	4	4
Lift Capacity (Evenly Distributed)	2000 LB	907 kg	1500 LB	680 kg	1000 LB	454 kg
Roll-out Deck Capacity	500 LB	227 kg	500 LB	227 kg	500 LB	227 kg
Platform Dimensions						
With Roll-Out Deck Extended	180 IN	4.57 m	180 IN	4.57 m	180 IN	4.57 m
With Roll-Out Deck Retracted	132 IN	3.35 m	132 IN	3.35 m	132 IN	3.35 m
Deck Width (inside)	71 IN	1.80 m	71 IN	1.80 m	71 IN	1.80 m
Guardrail Height	44.5 IN	1.13 m	44.5 IN	1.13 m	44.5 IN	1,13 m
Toeboard Height	7.0 IN	18 cm	7.0 IN	18 cm	7.0 IN	18 cm
Roll-out Deck Length	48 IN	1.22 m	48 IN	1.22 m	48 IN	1.22 m
Overall Length	144 IN	3.66 m	144 IN	3.66 m	144 IN	3.66 m
With Outriggers	180 IN	4.57 m	180 IN	4.57 m	180 IN	4.57 m
Overall Width	91 IN	2.31 m	91 IN	2.31 m	91 IN	2.31 m
Wheel Base	102.5 IN	2.60 m	102.5 IN	2.60 m	102.5 IN	2.60 m
Wheel Track	78.5 IN	1.99 m	78.5 IN	1.99 m	78.5 IN	1.99 m
Turning Radius Inside	76 IN	1.93 m	76 IN	1.93 m	76 IN	1.93 m
Outside	195 IN	4.95 m	195 IN	4.95 m	195 IN	4.95 m
Ground Clearance	12.0 IN	30.48 cm	12.0 IN	30.48 cm	12.0 IN	30.48 cm
Machine Weight** (Unloaded) (Approx.)	8,000 LB**	3629 kg**	8,700 LB**	3946 kg**	9,700 LB**	4400 kg**
Drive System (Proportional)		2 \	Wheel Drive Standa	rd, 4 Wheel Drive ()ption	
Drive Speed (Platform Elevated)	0 – 0.8 MPH	0 –1.3 km/h	0 – 0.8 MPH	0 –1.3 km/h	0 – 0.8 MPH	0 –1.3 km/h
Drive Speed (Platform Lowered)	0 – 3.8 MPH	0 – 6.1 km/hr	0 – 3.8 MPH	0 – 6.1 km/hr	0 – 3.8 MPH	0 – 6.1 km/hr
Brakes	Multi disc	Multi disc	Multi disc	Multi disc	Multi disc	Multi disc
Lift/Lower Speed (Approx.)	25 sec / 30 sec	25 sec / 30 sec	33 sec / 35 sec	33 sec / 35 sec	40 sec / 50 sec	40 sec / 50 sec
Gradeability	45% / 24.2°	45% / 24.2°	45% / 24.2°	45% / 24.2°	45% / 24.2°	45% / 24.2°
Ground Pressure/Wheel (Maximum)	115 PSI	8.09 kg/cm ²	117 PSI	8.23 kg/cm ²	122 PSI	8.58 kg/cm ²
Tire Size-Standard	12-16.5 NHS	6 "Outrigger"	12-16.5 NHS	"Outrigger"	12-16.5 NHS	"Outrigger"
Tire Pressure, 12 Ply Pneumatic	80 PSI	5.5 bar	80 PSI	5.5 bar	80 PSI	5.5 bar
12 Ply Foam-Filled	Foam-Filled	Foam-Filled	Foam-Filled	Foam-Filled	Foam-Filled	Foam-Filled
Wheel Load	3437 LB	1559 kg	3497 LB	1586 kg	3647 LB	1654 kg
Wheel Lug Nut Torque	150-165 FT/LB	204-225 Nm	150-165 FT/LB	204-225 Nm	150-165 FT/LB	204-225 Nm
Hydraulic Pressure Main System	3000 PSI	207 bar	3000 PSI	207 bar	3000 PSI	207 bar
Lift System	2500 PSI	172 bar	2650 PSI	183 bar	2500 PSI	172 bar
Steer	1500 PSI	103 bar	1500 PSI	103 bar	1500 PSI	103 bar
Hydraulic Fluid Capacity	23 GAL	87 liters	23 GAL	87 liters	23 GAL	87 liters
Fuel Capacity	15 GAL	57 liters	15 GAL	57 liters	15 GAL	57 liters
Power System – Voltage	12 Volts DC	12 Volts DC	12 Volts DC	12 Volts DC	12 Volts DC	12 Volts DC
Alternator (Lighting Coil)	40 Amp	40 Amp	40 Amp	40 Amp	40 Amp	40 Amp
Engine Availability Standard		Kubota DF	752E, 22 HP (16.4	kW), Dual Fuel, Lic	uid Cooled	
Engine Availability Standard						

*Working height adds 6 feet (2 m) to platform height. **Weight may increase with certain options or country standards.





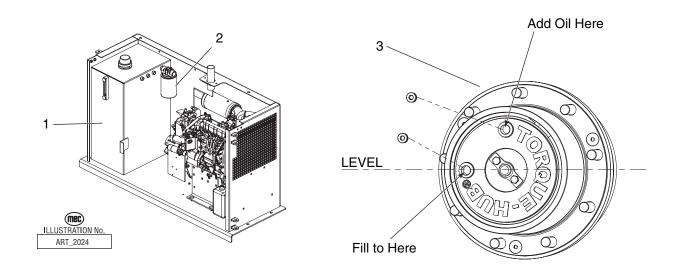


PRIMARY MACHINE COMPONENTS

Component	Service Section	Parts Section	Component	Service Section	Parts Section	
Platform Assembly			Control Module			
Upper Controls	2 4 5	А	Lower Controls	2 3 4 5	A F	
Deck and Rails	3	В	Hydraulic Manifold	1 3 4 5	E F	
Chain Closure		В	Parking Brake Release	intro		
Optional Gate		В	Emergency Lowering	intro 1 5	F	
Extension Deck		В	Fuel Tank	5	F	
Control Terminal Strip	5	В	Fuel Shutoff	5	F	
Horn (optional)	2 5	A B	Power to Platform	5	B F	
Beams	3	С	Tilt Sensor	2 3 4 5	F	
Maintenance Lock	intro	С	Battery & Disconnect	2 4 5	F	
Lift Cylinders	1 3 4 5	C E	Outrigger Manifold	1 3 4 5	E F	
Limit Switch	2 4	С	Outrigger Control Module (Outrigger Option)	3 5	F	
Base Assembly			AC Generator (Option)	1 5	E F	
Front Drive Motors	intro 1 3 4 5	D				
R Drive Motors w/Brakes	intro 1 3 4 5	D				
Steering Components	1 3 4 5	D				
Wheels & Tires	intro 3	D				
Hubs	intro	D				
Brakes	intro 1 3	D				
Axle Lock	1 3	D E	Relays			
Emergency Lowering	intro 1 5	E F	Platform Power	2 4 5	A F	
Hoses & Cables	1 3	C E F	Torque Speed	2 4 5	F	
Outrigger (Option)	1 2 3 4 5	E F	Throttle	2 4 5	F	
LPG (Option)	3 5	F	Preheat	2 4 5	F	
Power Module			Outrigger (Option)	2 3 4 5	F	
Engine	3 4 5	F	AC Generator (Option)	1 5	F	
Hydraulic Pump	1 4 5	F				
Hydraulic reservoir	intro 1	F				
Hydraulic Filter	intro 1	F				

LUBRICATION

NO.	ITEM	SPECIFICATION	FREQUENCY OF LUBRICATION
1	Hydraulic Reservoir	Fill To The Middle Of The Sight Gauge With Platform In The Stowed Position. Mobile Fluid 424. <i>Do not substitute</i> <i>with lower grade oils as pump</i> <i>damage may result.</i>	Check Daily. Change Yearly or Every 1,000 Hours, whichever occurs first.
2	Hydraulic Filter	Filter Element	Change Every Six Months or 500 Hours, whichever occurs first for Normal Usage. Change Every Three Months or 300 Hours, whichever occurs first for Severe Usage.
3	Hubs	SAE 90 Multipurpose Hypoid Gear Oil. API Service Classification GL5	Check Every Three Months or 250 Hours, whichever occurs first for Normal Usage Change Yearly or every 1000 Hours, whichever occurs first for Severe Usage.





EMERGENCY SYSTEMS AND PROCEDURES



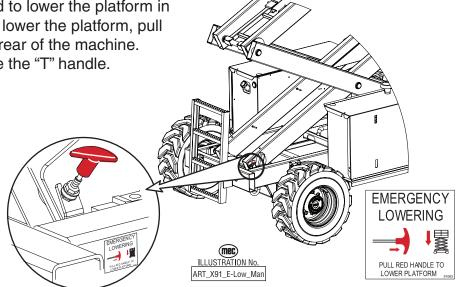
IF THE CONTROL SYSTEM FAILS WHILE THE PLATFORM IS ELEVATED, HAVE AN EXPERIENCED OPERATOR USE THE EMERGENCY LOWERING PROCEDURE TO SAFELY LOWER THE PLATFORM.

DO NOT ATTEMPT TO CLIMB DOWN BEAMS (SCISSORS) ASSEMBLY.

BEFORE LOWERING PLATFORM, RETRACT THE DECK EXTENSION.

Emergency Lowering - 2591RT and 3391RT

Emergency Down system is used to lower the platform in case of power or valve failure. To lower the platform, pull the red "T" handle located at the rear of the machine. Lowering stops when you release the "T" handle.



Emergency Lowering - 4191RT

The Emergency Down System is used to lower the platform in case of power or valve failure. To lower the platform, perform the following steps:

- 1. Push down on the toggle switch and hold it to lower the platform to the desired height.
- 2. Once the platform is fully lowered, release the toggle switch to close the valve. **EMERGENCY LOWERING** ILLUSTRATION No. ACTUATE SWITCH TO LOWER PLATORM **Emergency Lowering Switch** ART_RT_E-Low_Elect



P

PARKING BRAKE AND TOWING CIRCUIT

Note: Refer to *Parts Section E* for hose routing.

Machine can be winched or moved short distances in case of power failure at speeds not to exceed 5 MPH (8.05 kph).

Towing/Winching The Machine

Your machine is equipped with a hub disengage mechanism.



PRIOR TO MANUALLY RELEASING BRAKES, INSURE WHEELS ARE CHOCKED TO PREVENT MACHINE FROM MOVING.

Disengage Brakes Before Towing:

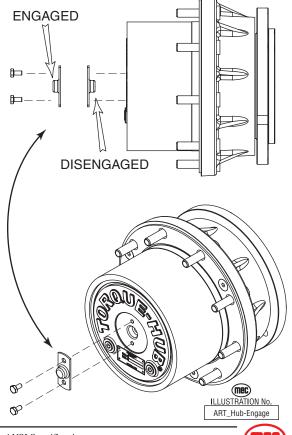
- Chock the wheels.
- Remove the Torque Engage Cap and reinstall with the bump facing *inward* on all four hubs (see illustration).
- Machine is now ready for towing.



AFTER DISENGAGING HUBS THERE IS NOTHING TO STOP THE MACHINE'S TRAVEL. MACHINE WILL ROLL FREELY ON SLOPES. BE ON GUARD AGAINST RUNAWAY.

Engage Hubs Before Driving:

- Remove the Torque Engage Cap and reinstall with the bump facing *outward* on all four hubs (see illustration).
- Machine is now ready for driving.



"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

LIFT AND SUPPORT THE MACHINE

THE USE OF SUBSTANDARD LIFTING DEVICES AND/OR JACK STANDS MAY CAUSE THE MACHINE TO FALL RESULTING IN DEATH OR SERIOUS PERSONAL INJURY.

The following are needed to safely lift and support the machine;

- a jack with a lifting capacity of two (2) tons or more.
- jack stands with a rating of one (1) ton or more.

To raise the machine

- 1. Move machine to a firm level surface capable of supporting the weight of the machine.
- 2. Chock tires on one end of machine and raise the other end of machine.
- 3. If wheel is to be removed, loosen but *do not remove* lugs before raising the machine.
- 4. Position a jack at the end of the machine to be lifted, under a solid lifting point in the center of the frame.
- 5. Raise the machine and place two (2) suitable jack stands under solid support points at the outer ends of the frame.
- 6. Lower the machine to rest on the jack stands and inspect for stability.

To lower the machine

- 1. Tighten lugs to proper torque (refer to machine specifications).
- 2. Raise machine slightly and remove jack stands.
- 3. Lower the machine and remove the jack.
- 4. Remove chocks.







Hydraulic Components Torque Table	1-2
Hydraulic System - General	1-3
Hydraulic Fluid	1-4
Hydraulic Fluid Reservoir	1-6
Hydraulic Pump	1-7
Hydraulic Manifold	1-10
Drive and Brake System	1-12
Floating Axle Lock Cylinder	
Steering Circuit	1-16
Platform Lift Circuit	1-18
Optional Outriggers	1-20
Optional Generator	
Cylinder Repair	1-22



HYDRAULIC COMPONENTS TORQUE TABLE

Note: Always lubricate threads with clean hydraulic fluid prior to installation.

Use the following values to torque hydraulic components when a specific value is not available. Always check for torque values in the following places before relying on the Hydraulic Components Torque Table;

- Section E of the Parts portion of this manual.
- •packaging and instruction sheets provided with new parts.
- ♦ instruction manuals provided by the manufacturer of the component being serviced.

TYPE: SAE PORT SERIES C		CARTRIDGE POPPET		FITTINGS		HOSES	
	FT. LBS	Nm	FT. LBS	Nm	FT. LBS	Nm	
#4	N/A	N/A	N/A	N/A	135 - 145	15 - 16	
#6	N/A	N/A	10 - 20	14 - 27	215 - 245	24 - 28	
#8	25 - 30	31 - 41	25 - 30	34 - 41	430 - 470	49 - 53	
#10	35 - 40	47 - 54	35 - 40	47 - 54	680 - 750	77 - 85	
#12	85 - 90	115 - 122	85 - 90	115 - 122	950 - 1050	107 - 119	
#16	130 - 140	176 - 190	130 - 140	176 - 190	1300 - 1368	147 - 155	



HYDRAULIC SYSTEM - GENERAL

The hydraulic system is an open center, open–loop type. Generally in this type of system, hydraulic fluid is provided by a variable displacement, pressure compensated, piston type pump which is directly coupled to the engine. As the engine turns, the hydraulic pump drains fluid from the reservoir and pumps this fluid to the valve packages.

If no function is selected to perform, the pump remains on standby and no fluid is pumped through the manifold. Each function has a maximum pressure control limit set by pressure relief valve.

Hydraulic integrated circuit, generally known as the manifold system (valve type) is designed to control all or part of machine functions by integrating various hydraulic cartridge valves into a manifold to provide directional, pressure, flow, and load control.

Hydraulic Roadmap

Hydraulic Reservoir

Hydraulic fluid is held in the reservoir for delivery to the various components and then returned to the reservoir. Returning hydraulic fluid is routed through a filter before entering the reservoir.

<u>Pump</u>

When required, the variable displacement pump delivers hydraulic fluid under pressure to the main hydraulic manifold. Pump volume is controlled by a load sense system.

Hydraulic Manifold

The main manifold directs the hydraulic fluid to the hydraulically operated components and returns fluid to the reservoir through the use of electronically operated solenoid valves.

Drive and Brake System

2 Wheel Drive machines are equipped with two (2) hydraulically operated drive motors.

4 Wheel Drive machines are equipped with four (4) hydraulically operated drive motors.

Each motor is connected to a gear reduction hub. The hubs on the rear drive motors are equipped with spring applied - hydraulically released brakes.

Floating Axle Lock Cylinders

Two (2) hydraulic cylinders control the floating axle on the rear of the machine. When platform is elevated, the cylinders lock into place to increase machine stability.

Steering System

Two (2) hydraulic cylinders control steering.

Lift System

The 2591RT and 3391RT are equipped with one (1) hydraulic lift cylinder.

The 4191RT is equipped with two (2) hydraulic lift cylinders.

Optional Outrigger System

If equipped, the *main hydraulic manifold* delivers fluid to the *outrigger hydraulic manifold*. Hydraulic fluid is then directed to four (4) hydraulic cylinders, one at each corner of the machine.

Optional Generator System

If equipped, the generator is driven by a hydraulic motor which receives hydraulic fluid directly from the pressure port of the pump.



HYDRAULIC FLUID

Handling Precautions

! WARNING !!!

PERSONS IN REGULAR CONTACT WITH MINERAL-BASED HYDRAULIC FLUID NEED TO BE AWARE OF THE IMPORTANCE OF THOROUGH HYGIENE, AND THE PROPER METHODS FOR HANDLING MINERAL OILS IN ORDER TO AVOID POTENTIAL HAZARDS TO HEALTH.

If mineral- based hydraulic fluid is SPLASHED INTO THE EYES, it must be WASHED OUT THOROUGHLY using abundant quantities of water. If irritation persists, medical advice should be sought.



HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY OR BLINDNESS.

FLUID LEAKS UNDER PRESSURE MAY NOT ALWAYS BE VISIBLE.

Fluid Recommendations

MEC recommends the use of **Mobil Fluid 424** hydraulic fluid. Do not substitute with lower grade fluids as pump damage may result.



Hydraulic Fluid Analysis

Use the following as a guide to determine when analysis of the hydraulic fluid is necessary:

- Anytime the hydraulic pump is replaced.
- If fluid discoloration is noticed in the hydraulic reservoir sight gauge tube.
- If after the first 50 hours of operation, the hydraulic filter element is plugged.
- Anytime the hydraulic filter element shows signs of metal contamination.
- Once every six (6) months, under normal operating conditions.
- Every three (3) months, in extremely dusty or dirty operating conditions.

The hydraulic fluid analysis must be done by a qualified laboratory. Always provide the following information with the test sample.

- Type of hydraulic fluid (see lubrication chart for recommended hydraulic fluid and/or your records).
- Model and Serial number of machine from which sample was taken.
- Purpose of analysis: pump failure, discoloration, etc.
- Type of analysis: complete to show additive breakdown, acid buildup, viscosity, type and percent of contaminants; also, comparison to new fluid and recommendations.

Following the above guidelines will prevent premature failure of pumps, cylinder seals, drive motors, and unnecessary downtime.

If system flushing and replacement of fluid is recommended, refer to the flushing procedure.

System Flushing Procedure

- 1. With platform fully down, drain hydraulic fluid from hydraulic reservoir into a clean, empty container. Use an fluid filter cart so the fluid may be reused if analysis is good.
- 2. When the hydraulic reservoir is empty, remove suction strainer and hoses.
- 3. Remove the bypass filter and hose.
- 4. Flush the hoses with clean hydraulic fluid.
- 5. Discard old bypass filter element and replace.
- 6. Flush out the reservoir with hoses removed from the hydraulic reservoir.
- 7. Reinstall all hoses removed in the previous steps.
- 8. Fill hydraulic reservoir with filtered, fresh hydraulic fluid (refer to Lubrication Chart).
- 9. Loosen output hose fittings at pump to flood with hydraulic fluid. Tighten fittings.
- 10. Start up the machine. Briefly operate all functions. Two or three lift cycles may be necessary to purge all air from lift cylinder(s).
- 11. When the above procedures have been completed, fill hydraulic reservoir to full mark on sight gauge.
- 12. Check all leaks and correct as necessary. Machine is now ready to be placed back in operation.
 - **NOTE:** AVOID MIXING PETROLEUM AND SYNTHETIC BASE FLUIDS. IT IS NOT ADVISABLE TO MIX FLUIDS OF DIFFERENT BRANDS OR TYPES, EXCEPT AS RECOMMENDED.



HYDRAULIC FLUID RESERVOIR

This consists of the reservoir, a filler cap with breather, a drain plug, a sight gauge, and a bypass filter with a 10 micron filter element.

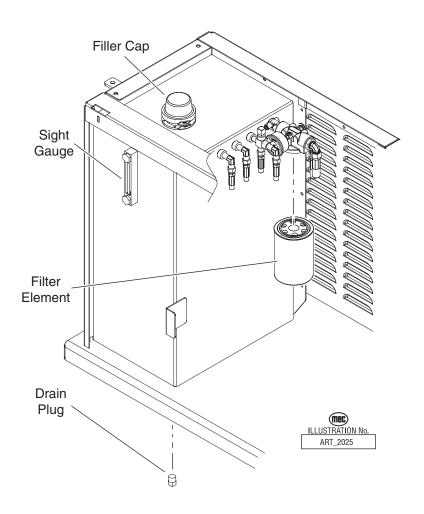
• Check reservoir for signs of leakage, every week.

Hydraulic Reservoir Assembly

All machines are produced with a spin-on, bypassing filter. When the filter is clogged, hydraulic flow bypasses the filter element. The filter element must be changed every six (6) months or 500 hours. Extremely dirty conditions may require that the filter be replaced more often.



BEWARE OF HOT FLUID. CONTACT WITH HOT FLUID MAY CAUSE SEVERE BURNS.





HYDRAULIC PUMP

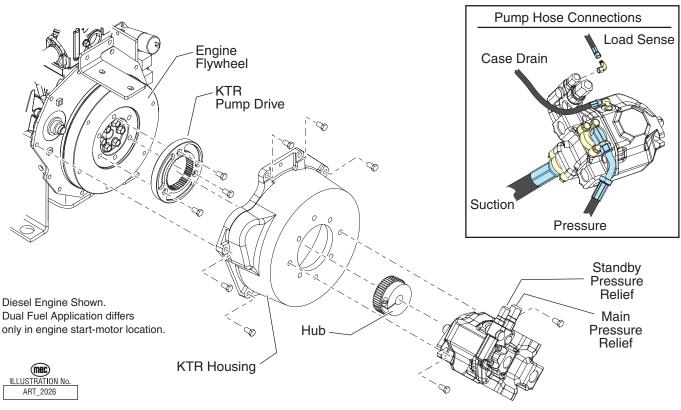
An internal combustion engine drives a variable displacement axial piston pump. Flow is proportional to drive speed and displacement.

<u>Remove</u>

- 1. Turn the Battery Disconnect Switch (inside Control Module) to the OFF position.
- 2. Tag and disconnect hydraulic hoses, and IMMEDIATELY cap or cover the openings to prevent contamination.
- 3. Remove the two (2) bolts that hold the pump to the housing.
- 4. Remove the pump.

<u>Install</u>

- 1. Install drive hub onto pump shaft. Torque bolt to 45 Ft. Lbs. (61 Nm).
- 2. Position the pump to the housing. Turn the pump until the splines on the hub align allowing the pump to become flush with the housing.
- 3. Turn the pump until the bolt holes align with the mounting holes on the housing and install the bolts. Torque to 25-28 Ft. Lbs. (35-38 Nm).
- 4. Install the hydraulic hoses.
- 5. Turn the Battery Disconnect Switch to the ON position.
- 6. Check for leaks and check all hydraulic pressures (refer to Section 4).





Note: Refer to *Section 4 – Hydraulic Pressure Adjustment Procedures.* Refer to *Parts Section F.*

Hydraulic Pump Seals

Drive Shaft Seal Replacement

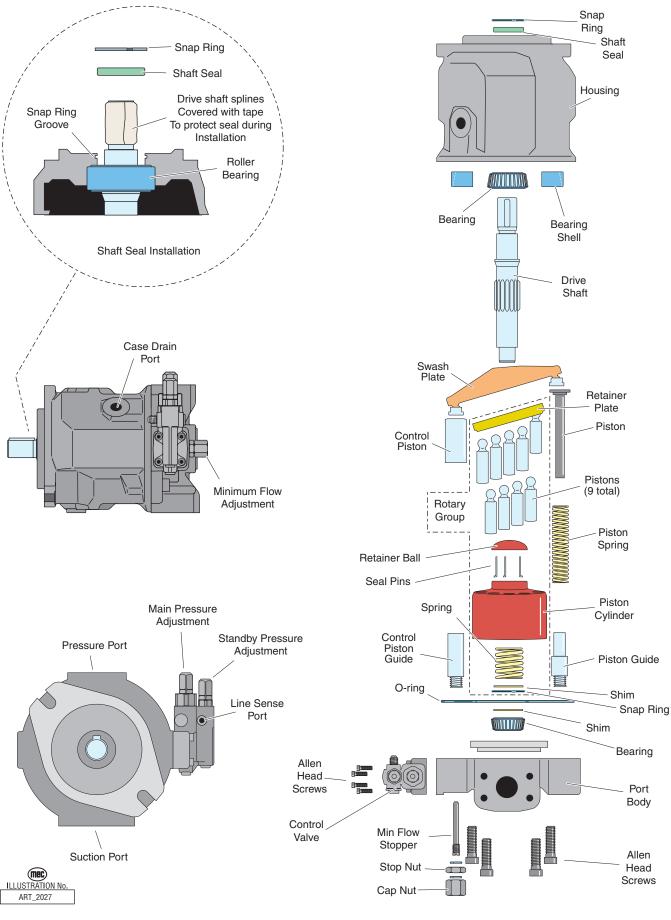
Caution: Be careful not to damage the drive shaft when removing the old seal.

- 1. Remove the shaft key.
- 2. Remove the snap ring.
- 3. Remove the shaft seal.
 - Check the surface of the shaft and the housing for imperfections.
- 4. Install new shaft seal.
 - Cover the drive shaft with tape to prevent damage to the seal during installation.
 - Coat the shaft seal with grease.
 - Seat the shaft seal with a seal setting tool.
- 5. Install the snap ring.
- 6. Install the shaft key.

Hydraulic Pump Rebuild

Pump rebuild should only be performed by a qualified mechanic. Contact MEC Technical Support before attempting to rebuild the pump.







HYDRAULIC MANIFOLD

Note: Refer to *Parts Section E*. Tag all components as they are removed to aid in reassembly.

Hydraulic Manifold Removal

- 1. Disconnect the negative battery terminal.
- 2. Tag and disconnect the solenoid valve leads.
- 3. Tag and disconnect hydraulic hoses, and IMMEDIATELY cap the openings to prevent contamination.
- 4. Remove the bolts that hold the manifold to the mounting bracket.
- 5. Remove the manifold block.

Disassembly

- 1. Remove coils from solenoid valves.
- 2. Remove valves.
- 3. Remove fittings, plugs, springs, balls, and orifices.

Cleaning and Inspection

- 1. Wash the manifold in cleaning solvent to remove built-up contaminants, then blow out all passages with clean compressed air.
- 2. Inspect the manifold for cracks, thread damage and scoring where O-rings seal against internal and external surfaces.
- 3. Wash and dry each component and check for thread damage, torn or cracked O-rings, and proper operation.
- 4. Replace defective parts and O-rings.

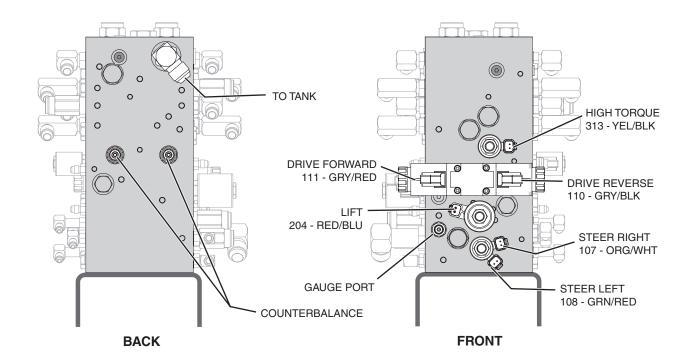
<u>Assembly</u>

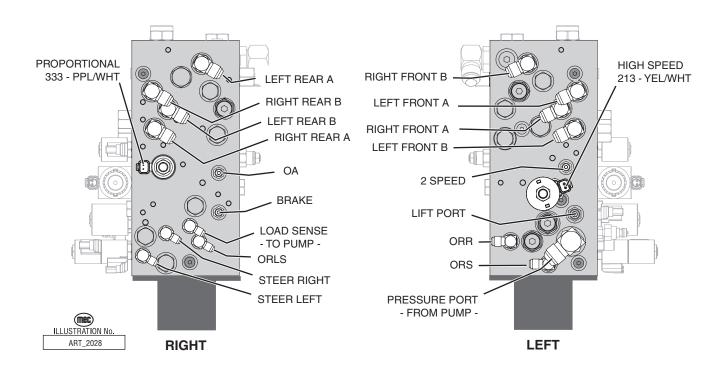
- **Note:** Lubricate all O-rings before installation to prevent damage to the O-ring. Seat balls in manifold block by lightly tapping on the ball with a brass drift punch.
- 1. Install fittings, plugs, springs, balls, and orifices. Use one drop of Loctite #424 or equivalent thread locker on each screw-in orifice.
- 2. Install valves.

Installation

- 1. Attach manifold assembly to mounting plate with mounting bolts.
- 2. Connect solenoid leads (as previously tagged).
- 3. Connect hydraulic hoses (as previously tagged). Be certain to tighten hoses.
- 4. Connect the battery.
- 5. Operate each hydraulic function and check for proper operation and leaks.
- 6. Adjust valve pressures.









DRIVE AND BRAKE SYSTEM

Wheel Drive

Note: Refer to *Section 3* for Remove and Install instructions. Refer to *Parts Section D*.

Drive motors are axial piston hydraulically operated. Each motor is connected to a gear reduction hub. Braking is a function of the gear reduction hub.

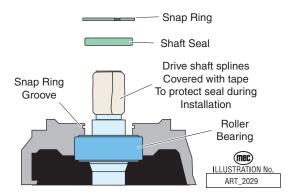
2 Wheel Drive machines are equipped with two (2) drive motors.

4 Wheel Drive machines are equipped with four (4) drive motors.

Drive Shaft Seal Replacement

Caution: Be careful not to damage the drive shaft when removing the old seal.

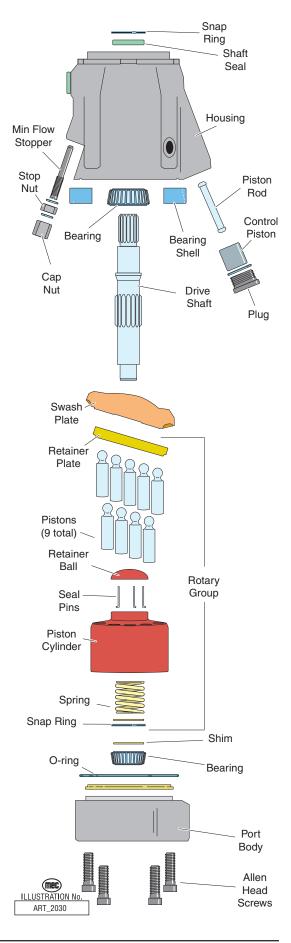
- 1. Remove the snap ring.
- 2. Remove the shaft seal.
 - Check the surface of the shaft and the housing for imperfections.
- 3. Install new shaft seal.
 - Cover the drive shaft splines with tape to prevent damage to the seal during installation.
 - Coat the shaft seal with grease.
 - Seat the shaft seal with a seal setting tool.
- 4. Install the snap ring.





Hydraulic Motor Rebuild

Motor rebuild should only be performed by a qualified mechanic. Contact MEC Technical Support before attempting to rebuild the pump.





Gear Reduction Hubs with Brakes

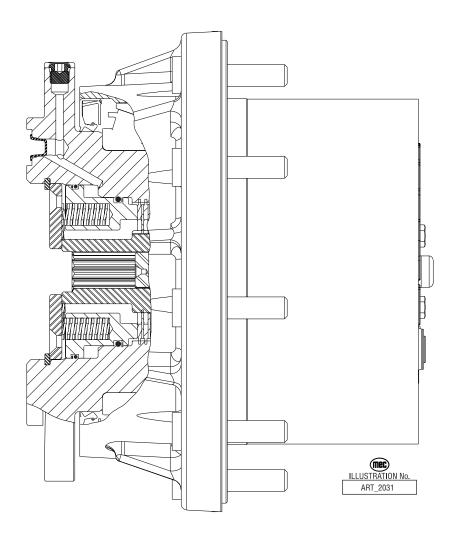
Note: Refer to *Section 3* for Remove, Replace, and Service instructions. Refer to *Parts Section E*.

All machines are equipped with two (2) gear reduction hubs with spring applied - hydraulically released brakes.

4 Wheel Drive machines are equipped with four (4) gear reduction hubs. Only the rear hubs are equipped with spring applied - hydraulically released brakes.

Service and Repair

Refer to Section 3 for brake repair and all other service for the Gear Reduction Hubs.

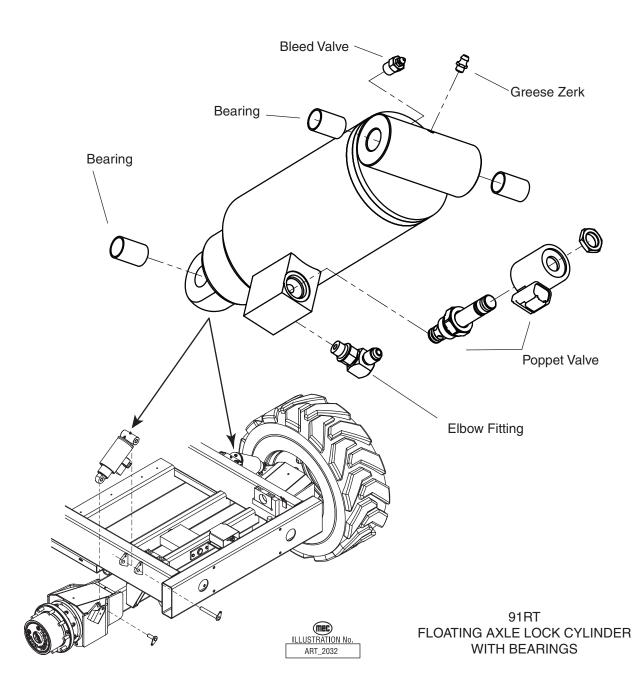




FLOATING AXLE LOCK CYLINDER

Note: Refer to *Cylinder Repair*. Refer to *Section 3* for Remove and Replace instructions. Refer to the *Parts Manual, Section E* for parts list.

There are two (2) cylinders utilized in the floating axle system. These cylinders allow fluid to transfer from one side to the other while the platform is in the stowed position. When the platform is elevated, the electrically operated valve closes, preventing fluid flow and thereby locking the cylinders.



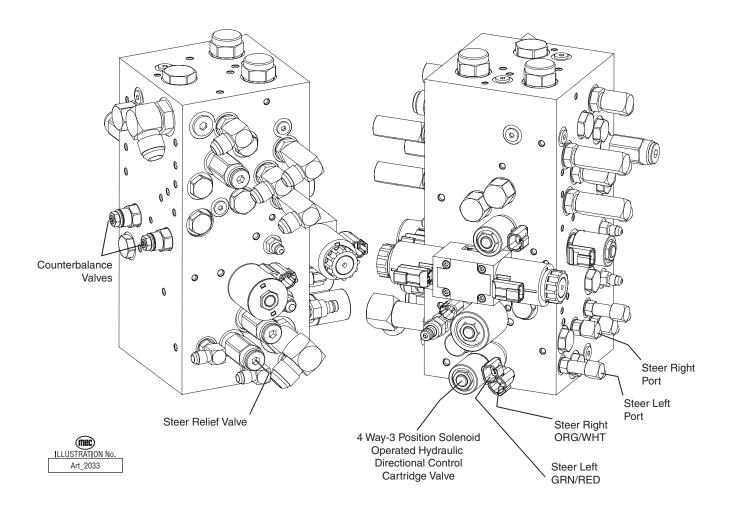


STEERING CIRCUIT

Note: Refer to *Hydraulic Manifold* and *Relief Pressure Adjustment Procedure*. Refer to *Section 3* for Remove and Replace instructions. Refer to *Parts Section E* for hose routing.

The steering system consists of the following components:

- The wheel motor housings have pivots on the top and bottom, and are mechanically linked together via a tie-rod.
- Steering is accomplished hydraulically by using two (2) double-acting cylinders, and a 4-way 3-position solenoid-operated, hydraulic directional control cartridge valve.
- Maximum steering pressure is limited by the steering relief valve (refer to *Relief Pressure Adjustment Procedure*).

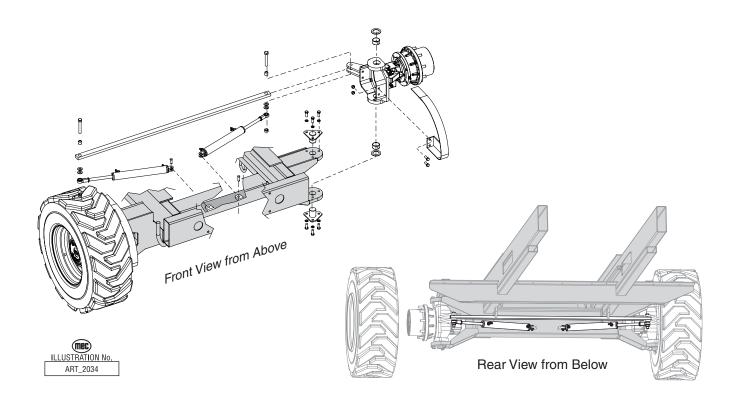




Steer Cylinder

Note: Refer to *Cylinder Repair*. Refer to *Section 3* for Remove and Replace instructions. Refer to the *Parts Manual, Section E* for parts list.

There are two (2) cylinders utilized in the steering system. These cylinders are a double acting type which requires fluid flow to operate the cylinder rod in both directions. Directing fluid forces the piston to travel towards the rod end of the barrel, extending the cylinder rod. By directing fluid to the rod side of the cylinder the piston will be forced in the opposite direction and the cylinder rod will retract.





PLATFORM LIFT CIRCUIT

- **Note:** Refer to *Hydraulic Manifold* and *Relief Pressure Adjustment Procedure.* Refer to *Section 3* for Remove and Replace instructions.
- The lift system uses the hydraulic pump to obtain proportional lifting function controlled by the lift valve and proportional valve.
- Lowering is single speed. When lowering, the holding valves on the lift cylinder(s) open allowing gravity to lower the platform. Lowering speed is regulated by a fixed orifice located on the lift cylinder(s) as fluid is returned to the reservoir.
- Platform capacity is limited by a hydraulic relief valve in the lift circuit. (Refer to Machine Specifications or the Hydraulic Schematic for proper setting).

Lift Cylinder

Note: Refer to Cylinder Repair.

2591RT AND 3391RT

One (1) single acting type hydraulic cylinder.

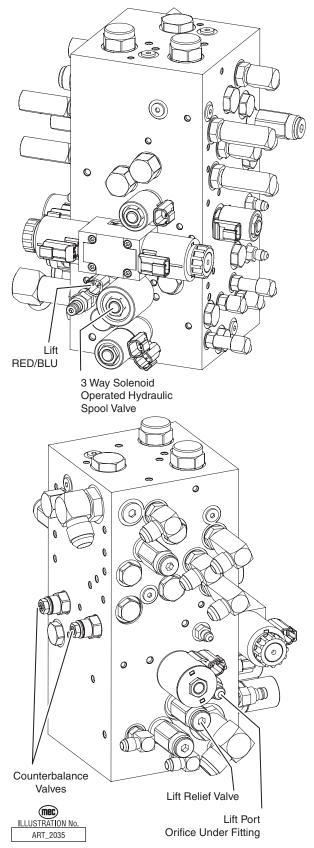
The cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve for holding the platform in position. The valve is also externally actuated via a cable for manually lowering the platform.

<u>4191RT</u>

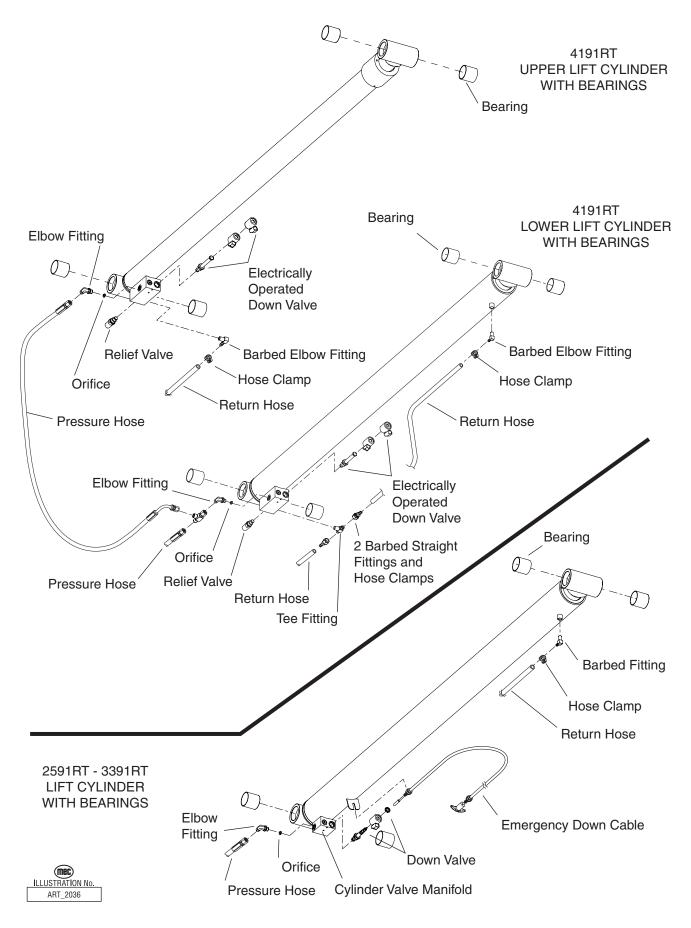
Two (2) single acting type hydraulic cylinders.

Each cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve for holding the platform in position. The valves are also electrically actuated via a toggle switch for manually lowering the platform.

The normally closed holding valve prevents retraction of the cylinder rod should a hydraulic line rupture or a leak develop between the cylinder and its related control valve.









OPTIONAL OUTRIGGERS

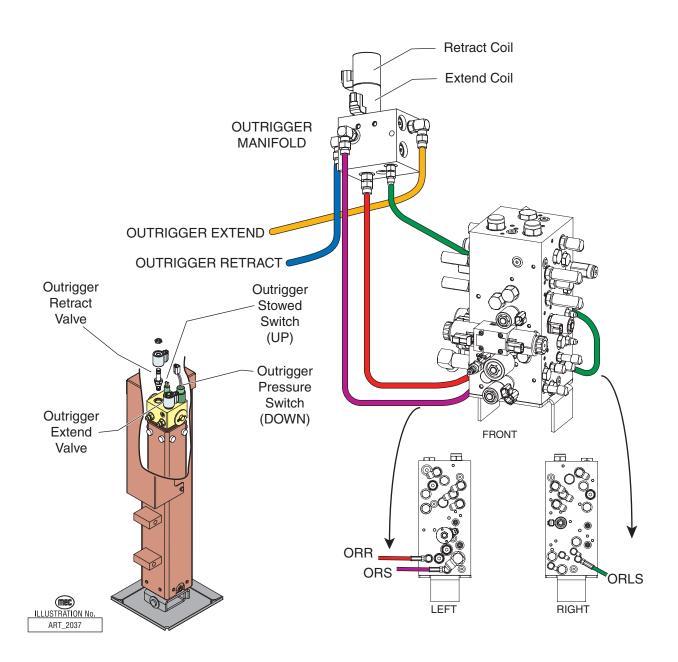
Note: Refer to *Section 3* for detailed description and troubleshooting. Refer to *Cylinder Repair*.

Outrigger Hydraulic Manifold

The Optional outrigger manifold is located in the Control Module behind the Lower Control Box.

Cylinders

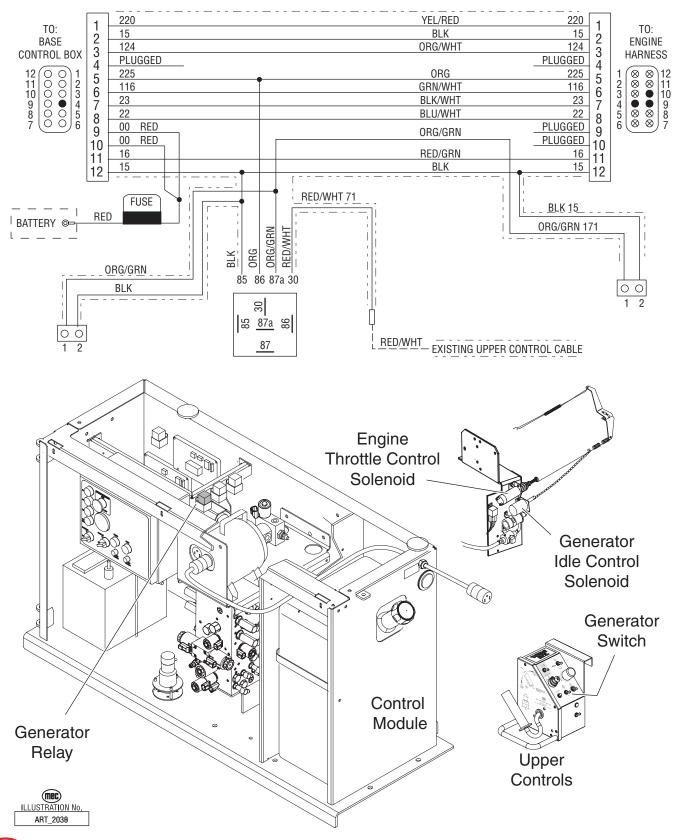
Four (4) double acting type hydraulic cylinders.





OPTIONAL GENERATOR

Note: Refer to *Section 5,* . Refer to *Parts Sections E and F*



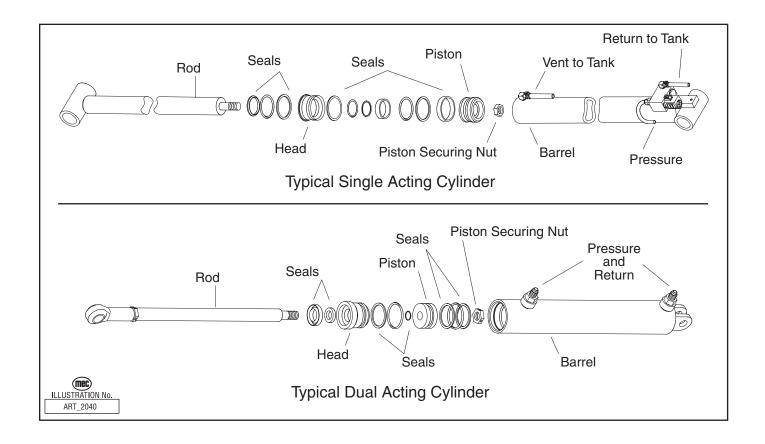


"2591RT / 3391RT / 4194RT" Service & Parts Manual - ANSI Specifications

CYLINDER REPAIR

! WARNING !!!

CYLINDERS ARE HEAVY. SUPPORT CYLINDERS BEFORE REMOVING HARDWARE THAT SECURES THE CYLINDER TO THE MACHINE.



Removal

- **Note:** Refer to *Section 3* for Remove and Replace instructions, and the *Parts Manual* for a list of hardware specific to the cylinder being repaired.
- 1. Tag hoses for proper reassembly.
- 2. Disconnect hoses and IMMEDIATELY cap the openings to prevent contamination.
- 3. Remove cylinder from the machine as described in *Section 3*.



Preparation



Take care not to damage rod surface and guard against dirt or other foreign objects entering system.

- 1. Drain all fluid from cylinder.
- 2. Clean all dirt and grit from outside of cylinder.
- 3. Insert cylinder into vise.

Cylinder Disassembly

- 1. Remove the head from the cylinder body.
- 2. Remove the shaft assembly from the barrel, pulling in a straight line, so as not to scar the internal parts.
- 3. Insert shaft into a **soft jawed** vise so that the head and piston can be removed. Be sure the shaft and vise are both clean before using.
- 4. Remove nut at the end of the shaft and pull head and piston off of the rod.
- 5. Remove all seals from the head and piston using a non-sharp seal tool. These tools are available from various seal suppliers.
- 9. Clean all fluid and debris off of the head, piston, shaft, collar and barrel using solvent, rags, and an air hose.
- 10. Inspect parts for scratches, pits or polishing. Check seal groves and sealing surfaces.
 - a. Scratches or pits deep enough to catch the fingernail are unacceptable; replace the cylinder.
 - b. Polishing is a sign of uneven loading. Check for roundness. If a polished surface is not round within .007 in. (0.18 mm) replace the cylinder.



Cylinder Assembly

CAUTION:

- To insure a quality repair, cylinder parts must be thoroughly cleaned, dry, and free of solvents, and assembly must be performed in a clean area free of dust and contamination.
- To avoid cutting the seals, do not use sharp edged tools during seal replacement. After installing seals allow at least one hour for the seals to restore to their original shape before assembling the cylinder.
- Torque all hardware according to the Hydraulic Components Torque Table unless otherwise specified.
- 1. Lubricate all components with clean hydraulic fluid.
- 2. Install new seal kit components. Install all seals on the head and piston using the nonsharp seal tool.
- 3. Place a small amount of fluid on the inside seals of the head and reinstall it on the shaft, by slipping head over the piston end of the shaft being very careful not to damage the inside seals.
- 4. Place a small amount of fluid on the inside seals of the piston and reinstall it on the shaft by slowly twisting the piston on over the threads of the shaft being very careful not to damage the inside seals.
- 5. Reinstall the shaft nut; torque 1 1/2" nut to 160 ft. lbs. (216 Nm).
- 6. Grease the outside seals of the head and piston.
- 7. Reinstall the shaft into the barrel of the cylinder and push in until groove of the head lines up with the slot in the barrel.
- 17. Reinstall the cylinder retainer. Installation is reverse of removal.
- 18. Cycle the cylinder using air to check for proper operation.
 - **NOTE:** It is very important to keep all parts clean when working with hydraulic cylinders, even one small piece of dirt or grit can damage the cylinder.



SECTION 2: ELECTRICAL SYSTEM

Electrical System - General	2-2
Deutsch Connectors	2-3
Battery	
Battery Preventative Maintenance:	
Battery Replacement	
Alarms and Switches	2-7
Tilt Alarm	2-8
Relays	2-9
Limit Switch	
Optional Outriggers Switches	2-10
Continuity Checks	



ELECTRICAL SYSTEM - GENERAL

The electrical control system consists of a base control station and a platform control station.

Base Control Station

The base control station, when enabled via the Base/Platform Selector Switch, disables the platform station and provides control for a fixed speed Lift UP/DOWN functionality.

Platform Control Station

The platform control station will operate all functions including drive/steer and lift/lower. Momentary bidirectional rocker switch on the drive controller handle (joystick) provides the steering function. The control system for operation of drive/steer and lift/lower are electric-over-hydraulic type. The drive and lift system is a proportional system controlled by position and direction of the upper control box controller handle (joystick).



DEUTSCH CONNECTORS

Deutsch connectors used on MEC equipment is designed so that individual parts may be replaced without replacing the entire component. Special tools and detailed instructions are provided in Deutsch Connector field kits, MEC part no. 84091.

Male Plug Connector

- Use the flat end of the Removal Tool or a flat blade screwdriver to pry the locking wedge from the connector, taking care not to damage the Sealing Gasket.
- Inspect and replace damaged parts.
- Replace or re-crimp wires and contacts.

Female receptacle Connector

- Use the notched end of the removal tool or a wire hook to pull the locking wedge from the connector
- Replace worn or damaged parts
- Replace or re-crimp wires and contacts.

Locking Fingers

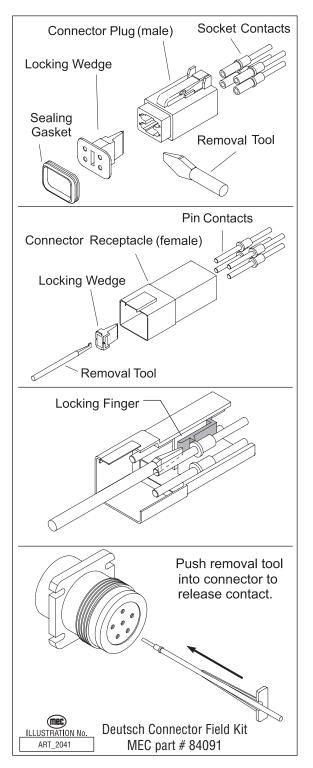
- Remove the locking wedge as outlined above.
- Using the removal tool or a flat blade screwdriver, push the Locking Fingers aside to release the contact.
- Pull the wire and contact out of the connector.

Heavy Duty Plug

- Slide the removal tool along the wire to be replaced and push into the connector to release the contact.
- Pull the wire and contact out of the plug.

Crimping

- Strip 1/4 in. (6 mm) insulation from the wire.
- Insert the contact into the crimping tool and insert the stripped wire into the contact making sure no wires are outside the contact barrel.
- Close the handles of the crimping tool, then release the handles to remove the crimped contact.





BATTERY

! WARNING !!!

CHARGING BATTERIES CREATE EXPLOSIVE HYDROGEN GAS. KEEP SPARKS, FLAMES AND SMOKING MATERIALS AWAY FROM BATTERIES.

ALWAYS WEAR SAFETY GLASSES WHEN WORKING WITH BATTERIES.

BATTERY FLUID IS CORROSIVE. THOROUGHLY RINSE SPILLED FLUID WITH CLEAN WATER.

REPLACE WITH MANUFACTURER APPROVED BATTERIES.

BEFORE DISCONNECTING THE BATTERY NEGATIVE (-) LEAD, MAKE SURE THAT ALL SWITCHES ARE OFF. IF ON, A SPARK WILL OCCUR AT THE GROUND TERMINAL THAT COULD IGNITE HYDROGEN GAS OR FUEL VAPORS.

A 12 volt battery supplies the electrical power required to start the engine and operate the electrical circuits.

Battery Maintenance (in storage)

Follow these procedures for maintenance of battery on a machine not in use:

- Keep battery clean. Electrolyte of batteries should be checked regularly and kept at proper level.
- Never stack one battery directly on top of another because post or container damage can
 result. If batteries are stored individually, place supporting boards between layers. Rotate
 stock so that the oldest batteries are used first.
- Batteries should be kept fully charged. A battery, while in storage, should be recharged to full charge at recommended intervals.

A battery fully (100%) charged at 80°F (26.6°C)

- drops to 65% at 32°F (0°C)
- drops to 40% at 0°F (-32°C)

Recommended Intervals

If Stored At:	Recharge:
Below 40°F (4°C)	None required
Above 60°F (15°C)	Every month
40°-60°F (4°-15°C)	Every 2 months



Battery Maintenance (in use)

Check battery and surrounding area for signs of damage or corrosion.

Check battery terminals for:

- Corrosion: Regularly clean connections and apply a nonmetallic grease or protective spray to retard corrosion.
- Loose connections: Be sure all cable connections are tightly secured, and that good contact is made with terminals.
- Broken or frayed cables: Be sure all connections are good and that no loose or broken wires are exposed. Replace as necessary.

Check battery electrolyte level. Replenish the electrolyte, if necessary. Remove vent caps before filling, and USE ONLY DISTILLED WATER. DO NOT OVERFILL. Fill to level indicator (or ½ inch over the top of separators, if there is no level indicator). Fill after charging to prevent overflow of acid due to expansion. Do not use a hose to add water to batteries.

Allowing the electrolyte level to drop below the top of the separators will lead to shortened battery life.

Excessive water usage can indicate that a battery has been overcharged, has been subjected to excessively high temperatures, or is nearing the end of its service life.

Battery Preventative Maintenance:

Every 15 hours (after battery has been charged), spot-check the specific gravity of two or more cells. A fully charged battery should indicate 1.28 specific gravity. If low readings are noted, check the following:

- Check terminals for corrosion, loose connections and broken or frayed cables.
- Check all cells with a hydrometer for variance in specific gravity. A variation of 0.03 points or more between cells is a cause for concern. Mark the low cells.

Recheck specific gravity of all cells after recharging. Wash the top of the battery, making sure all vents are in place. Do not allow cleaning water or other foreign matter to enter the cells. Use a solution of bicarbonate soda (5 tsp. of baking soda per quart of warm water) and water to wash the battery if there is an accumulation of acid.

Battery Specific Gravity and Voltage Table

SPECIFIC GRAV	ΊΤΥ	VOLTS DC				
	EACH CELL	PER CELL	12V BATTERY			
Fully Charged	1.280	2.10	12.60			
Fully Discharged	1.130	1.75	10.50			



Battery Replacement

To remove battery, follow these procedures.

! WARNING !!!

BEFORE REMOVING THE BATTERY FROM THE MACHINE, TURN OFF THE BATTERY DISCONNECT SWITCH. THERE SHOULD BE NO POWER.

Battery is located in the Control Module of the machine.

Always disconnect the negative battery cable first.

Remove bolts holding battery. Lift the battery from the compartment. Put the battery to the side and dispose of properly.



Prevent damage to battery and/or electrical system;

- Always disconnect the negative battery cable first.
- Always connect the positive battery cable first.

To install battery, reverse the process by positioning the battery in the compartment securely with hold down bolts. Connect battery cables. Always connect the positive cable first.



ALARMS AND SWITCHES

Emergency Stop Button

There are two red emergency stop buttons: one located on the platform control console and the other on the base control panel. This stop button, when in the "OUT" (ON) position, provides power to the desired control station. Also, the stop button, in the event of an emergency can be used to turn off the power by pushing "IN" (OFF). All functions stop immediately when depressed.

Turn the button clockwise to reset.

NOTE: As a safety feature, selecting and operating the base controls will override the platform controls, except the platform emergency stop button. The base control emergency stop button will stop all machine operations, even if the selector switch is switched to platform controls.

Selector Switch

Machine can be operated from the base/ ground or platform controls. Activation of one or the other is achieved with this switch.

With the platform controls selected, from the base control panel, if the platform up/ lower function is operated there should be NO movement. Similarly with the base controls selected, from the platform control console if any machine function is operated, there should be NO movement.

Diagnostic LED's

There are Diagnostic LED's located on the Printed Circuit Board inside the Base Control box. Each LED represents a function. When the LED is ON the function is ENERGIZED. Refer to the *DIAG*-*NOSTIC LED'S* label to identify the LED function.

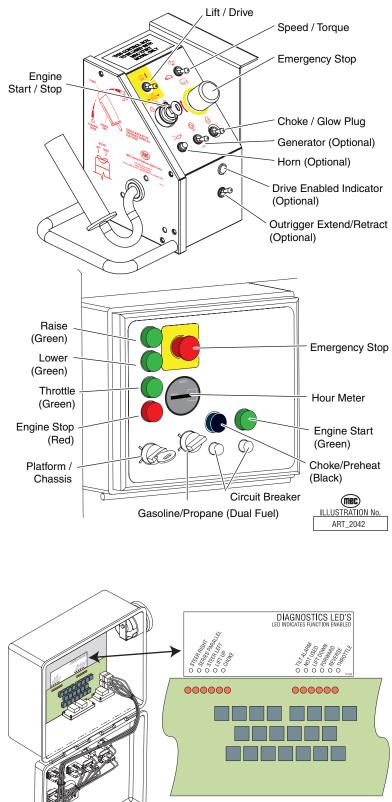




ILLUSTRATION No.

ART_2043

Tilt Alarm

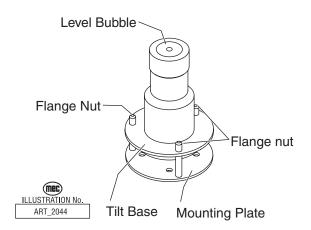
The tilt sensor is located in the Control Module.

Tilt Alarm Audible

An audible warning is activated once machine is in the raised position and reaches an unsafe angle; all functions are disabled in this condition except Platform Lower.

Tilt Alarm Test

This can be tested by manually tipping the sensor. This "Push-To-Test" feature enables tilt alarm to be tested without losing its adjustment. Individually push down on each of the three fastened corners of the tilt alarm.



There should be enough travel to cause the alarm to sound as each corner is pressed. (There is approximately a three second delay). If the alarm does not sound, the flange nuts have been tightened too far. Loosen the nut on the 90° corners and repeat this test procedure.

Tilt Alarm Sensor Adjustment

- Before attempting to adjust the alarm, park the machine on a firm, flat, level surface. Use of an inclinometer is recommended to ensure front and rear of base is level.
- Adjust the three flange nuts until the bubble on top of the sensor is centered.
- Check that the electrical connections are correct and secured tight.

Master Disconnect Switch

Battery disconnect is provided in the Control Module to facilitate servicing and also to prevent unauthorized use of vehicle by using a padlock (to provide security).

Movement Alarm - Light (optional)

This light is activated as soon as the platform control console joystick (controller) lever is moved off the center "Neutral" position.



THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND PROTECTION OF PERSONS WORKING IN THE IMMEDIATE AREA. DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN SERIOUS INJURY OR DEATH.



Relays

There are relays located inside the control module and inside the Upper Controls. (Refer to the Section 5 for relay functions and interconnect).

Upper Control Power Relay

Purpose: Cuts power to Upper Controls when Lower Controls are selected.

Torque/Speed Relay

Purpose: Disperses power to Torque Solenoid Valve when high speed or low speed is selected.

Outrigger Relay (option)

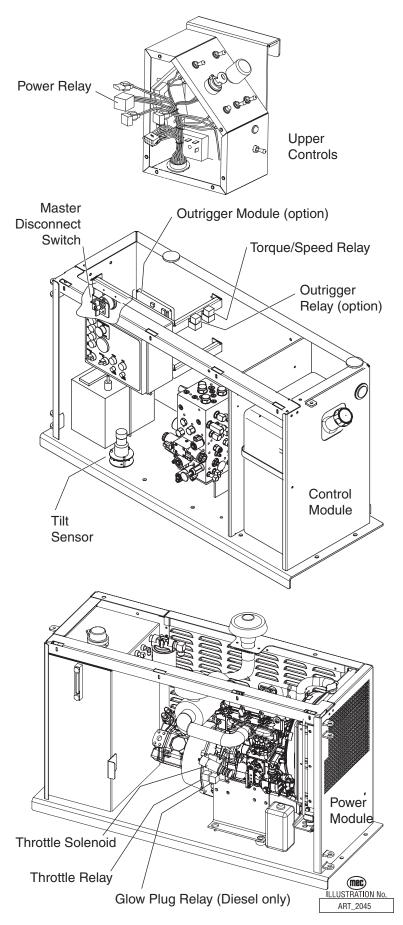
Purpose: Cuts power to Lift circuits until Outriggers are fully deployed and in firm contact with the ground.

Throttle Relay

Purpose: The electric throttle solenoid receives its power through the Throttle Relay.

Glow Plug Relay

Purpose: The diesel engine glow plug receives its power through the Glow Plug Relay.





LIMIT SWITCH

The Limit Switch indicates Platform Height above approximately 10 feet (3 m). The switch operates in conjunction with the circuit board located in the lower control box and the proportional circuit board located in the upper control box.

Lower Controls Circuit Board

When the platform is elevated above 10 feet (3 m). The limit switch is depressed and opened, causing the circuit board to;

- enable tilt sensor cutout operation.
- lock-out high torque and high speed.
- lockout outrigger operation.
- prevent drive when axle is not centered.

Upper Controls Proportional Circuit Board

When the platform is elevated above 10 feet (3 m). The limit switch is depressed and opened, causing the proportional circuit board to;

 limit proportional output to approximately 25% in drive (elevated drive speed).

OPTIONAL OUTRIGGERS SWITCHES

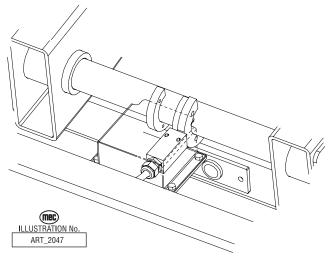
If the machine is equipped with outriggers, each of the four (4) outriggers has a Stowed Switch and a Pressure Switch.

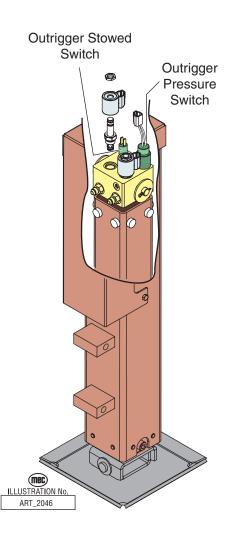
Outrigger Stowed Switch

- Indicates full retraction of the outrigger cylinder.
- **Drive Function:** The machine will drive when the Outrigger Stowed Switch on all four (4) outriggers is engaged. If one (1) or more Outrigger Stowed Switch is open (not engaged) the machine *will not drive*.
- Lift Function: If one (1) or more Outrigger Stowed Switch is open (not engaged) the machine *will not lift* unless all four (4) outriggers are fully deployed.

Outrigger Pressure Switch

- Indicates full deployment of the outrigger.
- Lift Function: When deployment begins the Outrigger Stowed Switches open and lift function is disabled. When all four (4) outriggers reach full deployment the Outrigger Pressure Switches close (engage) and lift function is restored.







CONTINUITY CHECKS

Check Toggle Switch:

- Disconnect wires and connect one probe of ohm meter to the connection on toggle switch and other probe on other connection.
- When toggle is open, there should be no reading, and when closed there should be a low reading.

Check Selector Switch

- Disconnect wires and connect one probe to common of switch and the other to normally open terminal.
- With the switch flipped, there should be a low resistance.

Check Emergency Stop Button

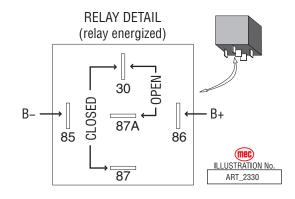
- Disconnect wires and connect one probe of ohm meter to connection on button and other probe on other connection.
- There should be no reading with the button pressed and a low resistance with it reset.

Check Relay Operation (refer to illustration)

- With the #85 terminal grounded, apply voltage to #86 terminal connection.
- Confirm normally closed (#87A) contacts are opening. Continuity with #30 will be broken.
- Confirm normally open (#87) contacts are closing. Continuity with #30 will be made.

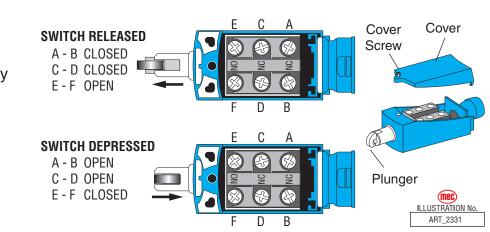
Check Limit Switch Operation (refer to illustration)

- Loosen cover screw and lift cover from switch.
- Mark and disconnect wires.



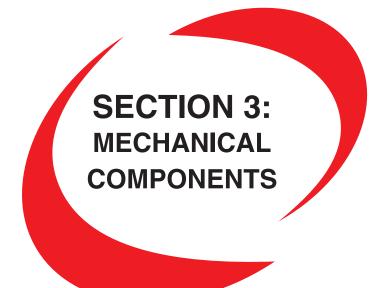
- With one probe of ohm meter to "A" and other probe to "B", release the plunger.
 Low resistance should be seen. Same result should be seen between "C" and "D".
- With one probe of ohm meter to "A" and other probe to "B", depress the plunger.
 High resistance should be seen. Same result should be seen between "C" and "D".

 "E" and "F" should show opposite results as seen on previous tests though there may not be any circuits on these terminals.









Torque Specifications	
Torque Specifications Mechanical Components	3-3
Base/ Undercarriage	3-3
Tires	
Drive Motors	
Gear Reduction Torque Hubs	
Steer Cylinder	
Floating Axle Lock Cylinder	
Hoses and Cables	3-16
Platform Removal	
Lift Cylinder Removal and Installation	
Scissor Beam Assembly	
Cable Routing	3-19
Engine Maintenance	3-20
Diesel Engine	3-20
Gasoline and Dual Fuel Engine	3-23
Outrigger Function	3-25
Outrigger Calibration	
GP106 Outrigger Control Module Troubleshooting	3-28
Outrigger Module GP106 LED Flash Codes	3-29



TORQUE SPECIFICATIONS

Fasteners

Use the following values to apply torque unless a specific torque value is called out for the part being used.

	AMERICAN STANDARD CAP SCREWS										METRI	C CAP S	CREWS				
SAE GRADE		5	i				8		METRIC GRADE	8.8			10.9				
CAP SCREW Size		TOR			TORQUE			CAP SCREW Size									
- inches -	FT.	LBS	N	m	FT. LBS Nm		- millimeters-	FT. LBS		Nm		FT. LBS		Nm			
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1/4 - 20	6.25	7.25	8.5	10	8.25	9.5	11	13	M6 X 1.00	6	8	8	11	9	11	12	15
1/4 - 28	8	9	11	12	10.5	12	14	16	M8 X 1.25	16	20	21.5	27	23	27	31	36.5
5/16 - 18	14	15	19	20	18.5	20	25	27	M10 X 1.50	29	35	39	47	42	52	57	70
5/16 - 24	17.5	19	23	26	23	25	31	34	M12 X 1.75	52	62	70	84	75	91	102	123
3/8 - 16	26	28	35	38	35	37	47.5	50	M14 X 2.00	85	103	115	139	120	146	163	198
3/8 - 24	31	34	42	46	41	45	55.5	61	M16 X 2.50	130	158	176	214	176	216	238	293
7/16 - 14	41	45	55.5	61	55	60	74.5	81	M18 X 2.50	172	210	233	284	240	294	325	398
7/16 - 20	51	55	69	74.5	68	75	92	102	M20 X 2.50	247	301	335	408	343	426	465	577
1/2 - 13	65	72	88	97.5	86	96	116	130	M22 X 2.50	332	404	450	547	472	576	639	780
1/2 - 20	76	84	103	114	102	112	138	152	M24 X 3.00	423	517	573	700	599	732	812	992
9/16 - 12	95	105	129	142	127	140	172	190	M27 X 3.00	637	779	863	1055	898	1098	1217	1488
9/16 - 18	111	123	150	167	148	164	200	222	M3 X 3.00	872	1066	1181	1444	1224	1496	1658	2027
5/8 - 11	126	139	171	188	168	185	228	251	-								
5/8 - 18	152	168	206	228	203	224	275	304	Torque			-					
3/4 - 10	238	262	322	255	318	350	431	474	from the			dry or	wher	1 lubri	cated	with	
3/4 - 16	274	302	371	409	365	402	495	544	normal								
7/8 - 9	350	386	474	523	466	515	631	698	If specia	-	-	-		-	-		
7/8 - 14	407	448	551	607	543	597	736	809	grease,								
1 - 8	537	592	728	802	716	790	970	1070	are used	d, the	se tor	que v	alues	do no	ot app	ly.	
1 - 14	670	740	908	1003	894	987	1211	1137									

Hydraulic Components

Use the following values to apply torque to hydraulic components. Always lubricate threads with clean hydraulic fluid prior to installation.

TYPE: SAE PORT SERIES	CARTRIDO	GE POPPET	FITT	INGS	HOSES		
	FT. LBS Nm		FT. LBS	Nm	FT. LBS	Nm	
#4	N/A	N/A	N/A	N/A	135 - 145	15 - 16	
#6	N/A	N/A	10 - 20	14 - 27	215 - 245	24 - 28	
#8	25 - 30	31 - 41	25 - 30	34 - 41	430 - 470	49 - 53	
#10	35 - 40	47 - 54	35 - 40	47 - 54	680 - 750	77 - 85	
#12	85 - 90	115 - 122	85 - 90	115 - 122	950 - 1050	107 - 119	
#16	130 - 140	176 - 190	130 - 140	176 - 190	1300 - 1368	147 - 155	



MECHANICAL COMPONENTS

Following is a description of the major mechanical components of the scissor lift.

Base/ Undercarriage



When steam cleaning the base/ undercarriage, cover electrical components to prevent water penetration.

Steam clean the base as necessary, and inspect all welds and brackets . Check for cylinder pins that turn in their mounting , which will indicate sheared retaining pins.

Tires

Inspect for cuts, chunking, side-wall damage, or abnormal wear. Any tire faults MUST BE COR-RECTED before further machine operation. Refer to Parts Manual Section for replacement tires.



FAILURE TO USE APPROVED PARTS MAY CAUSE DEATH OR SERIOUS PERSONAL INJURY.

NOTE: Replace tires with the correct tires to maintain the rating of this equipment.

Changing Tires

! WARNING !!!

FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.



Always block the wheels before raising the machine.

When a tire change is necessary, follow these tips:

- 1. Chock tires on one end of machine and raise the other end of machine (see *Intro Section Raising the Machine*).
- 2. Remove lug nuts and pull wheel off.
- 3. Install the replacement wheel.
- 4. Fasten lug nuts and tighten to proper torque. (Refer to machine specifications).
- 5. Lower the machine and remove the chocks.



Drive Motors

Refer to Section 1 for repair information.

There are two (2) hydraulic drive motors on the front axle and two (2) hydraulic drive motors on the rear drive axle. These can be damaged or leaks may occur; repair or replace as necessary.

CAUTION:

- Clean all fittings before disconnecting hoses.
- Tag hoses for proper reassembly.
- Plug all openings to prevent contamination.

Front Drive Motors

Remove

- 1. Raise and support the front end of machine (see Intro Section Raising the Machine).
- 2. Disconnect the cylinder end and tie-rod from the motor housing.
- 3. Turn the motor housing to gain access to the motor and hose assemblies.
- 4. Disconnect hose assemblies from drive motor.
- 5. Remove the cap screws and remove the drive motor.
- 6. Be careful not to damage or misplace O-ring.

Replace

Installation is reverse of removal.

Rear Drive Motor

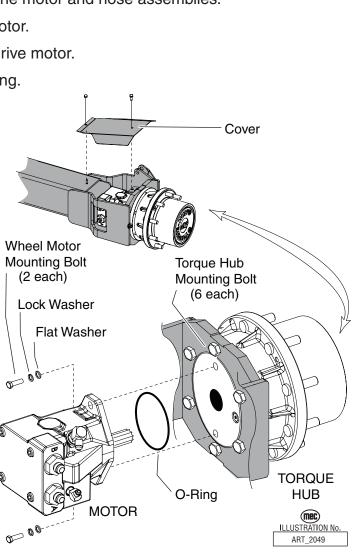
Remove

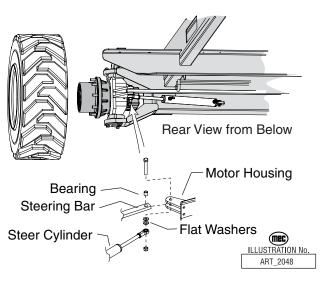
- 1. Raise and support the rear end of machine (see *Intro Section Rais*ing the Machine).
- 2. Remove the wheel and remove cover on top of axle.
- 3. Disconnect hose assemblies from drive motor.
- 4. Remove the mounting bolts.
- 5. Rotate the motor until parts face up. Remove the motor.
- 6. Be careful not to damage or misplace O-ring.

Replace

Installation is reverse of removal.

Use Loctite[®] on mounting bolts.





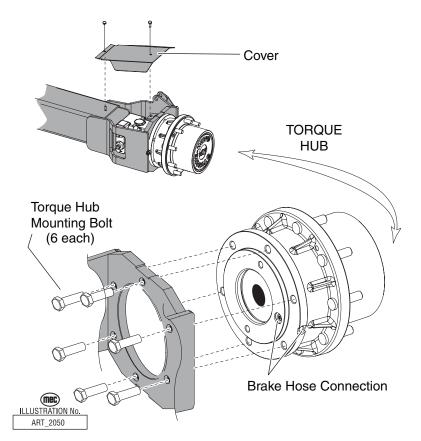


Gear Reduction Torque Hubs

There are two (2) gear reduction hubs on the front axle and two (2) gear reduction hubs with brakes on the rear axle.

Bleed Brake On Machine

- 1. Relocate the upper control box from the platform to a ground access point.
- 2. Loosen the brake hose approximately one (1) turn.
- 3. Start the machine and operate drive very slowly until all air is purged from the hose.
- 4. Tighten the hose fitting and check for leaks.
- 5. Repeat on opposite side.



Torque Hub Repair

Remove torque hubs from machine and move to a clean work surface.

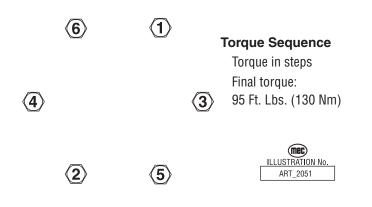
Remove

- 1. Remove the drive motor (see *Drive Motors* earlier in this section).
- 2. Support the torque hub and remove the six (6) mounting bolts.

Replace

Installation is reverse of removal. Use Loctite® on mounting bolts. Torque in steps.

- 1. Hand tighten mounting bolts in sequence (see illustration).
- 2. Apply torque in sequence: 20 Ft. Lbs. (81 Nm).
- 3. Apply torque in sequence: 60 Ft. Lbs. (81 Nm).
- 4. Apply final torque in sequence: 95 Ft. Lbs. (130 Nm).





Bench Test Torque Hubs

Torque Hubs should be roll and leak tested before and after repair to ensure that the gears, bearings and seals are working properly.

NOTE: Release brake before performing the roll test.

Release Brake

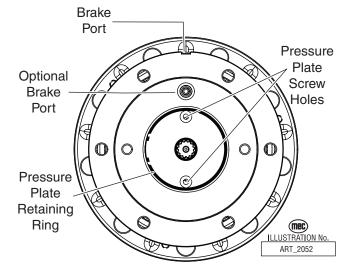
Brake can be released with hydraulic pressure or by compression.

Hydraulic Release

Refer to *Brake Test* later in this section.

Compression Release

- 1. Install two (2) $\frac{1}{4}$ -20 × 5/8" flat head cap screws through the pressure plate and into the piston.
- 2. Tighten one screw, then the other, a little at a time. Alternate screws until the springs compress and there is no pressure on the retaining ring.



NOTE: Remove bolts before performing brake release test.

Roll Test

- 1. Release brake as previously described.
- 2. Apply constant force to roll the gears and check for smooth operation.
 - **NOTE:** It may be difficult to roll the motor. This is acceptable as long as operation is smooth and consistent.
- 3. If inconsistency or drag is detected, the gears are not rolling freely and should be examined.

Leak Test

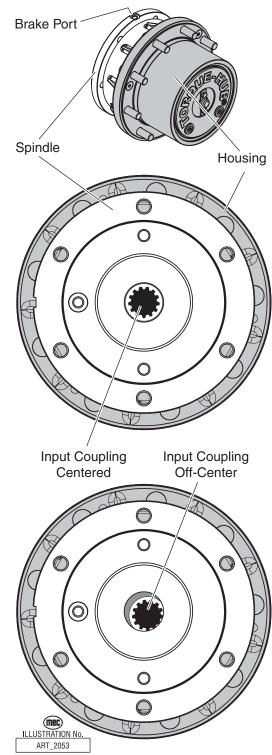
The unit must be air tight. Leaks usually occur at pipe plugs, the main seal, or around O-rings.

- 1. Attach an air pressure gauge at the brake port.
- 2. Pressurize the unit to 10 psi (.69 bar) and allow it to equalize. Let it stand for 20 minutes. If the pressure drops a leak is present.
- 3. With the unit pressurized, brush a soap and water solution around fittings, O-rings and seals and watch for bubbles.
- 4. Replace faulty components.



Brake Test

- 1. Connect hydraulic line from a hand pump to the brake port.
- 2. Ensure that the brake is set by trying to rotate the input shaft It should not rotate.
 - To rotate the input shaft, insert a splined shaft or other tool that will engage the splines of the input coupling.
- 3. Bleed Brake.
 - Gradually increase hydraulic pressure while trying to rotate the input shaft (tire/housing) until the brake just starts to release. The pressure should be from 200 to 260 psi (13.8 to 17.9 bar).
 - Full release should occur at 280 psi (19.3 bar).
- 4. Check for leaks
 - Increase and maintain pressure to 1,000 psi (69 bar) for 30 seconds.
 - Leaks must be repaired.
- 5. Center the input coupling in the spindle, then release pressure.
 - This will make it possible to install the motor without releasing the brake.
- 6. Ensure that brake engages when pressure is released.





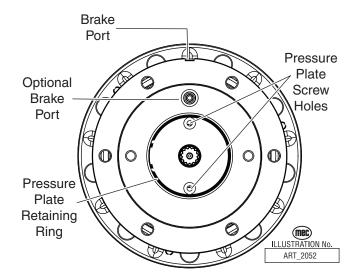
Brake Repair

Only the rear hubs have brakes. Remove torque hub and move to a clean work surface.

CAUTION: Wear eye protection.

Disassembly

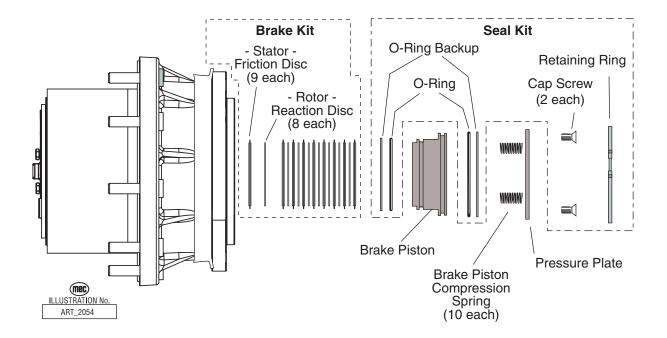
- 1. Compress the brake piston compression springs;
 - Install two (2) ¼−20 × 5/8" flat head cap screws (provided in brake kit) through the pressure plate and into the piston.
 - Tighten one screw, then the other, a little at a time. Alternate screws until the springs compress and there is no pressure on the retaining ring.
- 2. Use retaining ring pliers to remove the retaining ring.
- 3. Remove pressure plate;
 - Loosen one screw, then the other, a little at a time.
 - Alternate screws until the springs are loose.
 - Remove the cap screws and pressure plate.
 - Remove the compression springs.
- 4. Use air pressure to remove the brake piston;
 - Using an air hose, slowly and carefully pressurize the brake port until the piston is partially out of the piston bore.
 - Pull the piston the rest of the way out by hand.
- 5. Remove the backup rings and O-rings from the grooves in the piston.
- 6. Remove the reaction discs (rotors) and the friction discs (stators) from the brake cavity.





Assembly

- 1. Install brake kit;
 - Place a stator (friction disc) then a rotor (reaction disc) into the brake cavity, until there are nine (9) stators and eight (8) rotors (refer to illustration).
- 2. Install the brake piston seals;
 - Place the piston on a clean surface with the small opening facing upward.
 - Apply grease to the O-rings and backup rings.
 - Install the large diameter backup ring into the large diameter grove on the piston.
 - Install the large diameter O-ring on top of the backup ring.
 - Install and fully seat the small diameter O-ring into the small diameter groove on the piston.
 - Install the small diameter backup ring on top of the O-ring.
- 3. Insert the piston into the piston bore until it contacts the stator (friction disc).
- 4. Place the ten (10) springs into the piston.
- 5. Place the pressure plate on top of the springs and compress the springs (see *Step 1* of *Disassembly*).
- 6. Install the retaining ring, making sure it is fully seated.
- 7. Remove the two (2) cap screws or the brake will not function.





End Cover

Disassembly

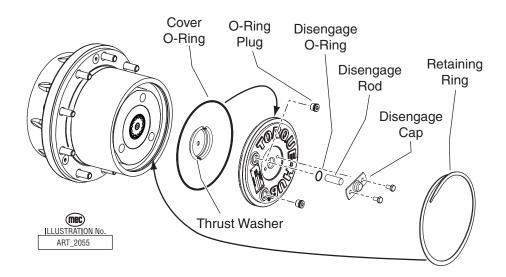
Remove torque hub and move to a clean work surface.

CAUTION: Wear eye protection.

- 1. Drain fluid from torque hub. Note the condition and volume of the fluid.
- 2. Remove the retaining ring.
 - Pry the open end of the retaining ring out of the groove with a screwdriver.
 - Use pliers to pull the retaining ring completely out of the groove.
- 3. Remove the cover subassembly.
 - The unit can be carefully pressurized with air to pop the cover out of the unit.
- 4. Remove the large diameter O-ring from the groove in the cover.
- 5. Remove the two (2) bolts from the disengage cap and remove the disengage cap.
- 6. Pull the disengage rod out from the cover.
- 7. Use appropriate tool to remove the disengage O-ring from the internal grove in the cover.
- 8. Remove the O-ring plugs from the cover.

Assembly

- 1. Grease the disengage O-ring and insert into the internal groove in the cover.
- 2. Install the disengage cap and torque bolts to 70–80 in. lbsl (8–9 Nm).
- 3. Insert the disengage rod, either end first, into the hole in the cover until it touches the disengage cover.
- 4. Grease the face of the thrust washer and place in the cover making sure the tangs on the washer seat into the pockets on the cover.
- 5. Install the O-ring plugs into the cover. Hand tighten only.
- 6. Grease the cover O-ring and insert it into the grove in the cover.
- 7. Install the cover and the retaining ring, making sure that the retaining ring is fully seated.





Replace Bearings

Disassembly

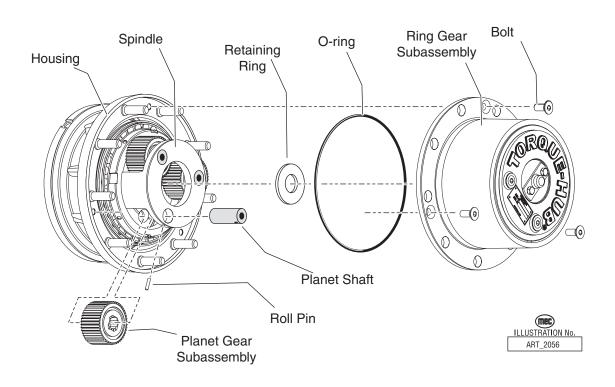
Remove torque hub and move to a clean work surface.

CAUTION: Wear eye protection.

- 1. Remove the Ring Gear Subassembly;
 - Remove the three (3) flathead bolts that secure the ring gear subassembly to the housing.
 - Lift the ring gear subassembly off of the housing.
 - Remove the O-ring from between the housing and ring gear subassembly.
- 2. Remove the planet gears;
 - Use a 1/8" diameter punch to drive the roll pin into the planet shaft until it bottoms against the spindle.
 - Using needle nosed pliers of a hooked tool, reach into the end of the planet shaft to grasp the roll pin and pull the planet shaft out of the spindle.
 - Drive the roll pin out of the planet shaft.

NOTE: Use new roll pins when reassembling the unit.

- Slide the planet gear subassembly out of the spindle being careful not to drop the needle bearings.
- Repeat for the two (2) remaining planet gears.

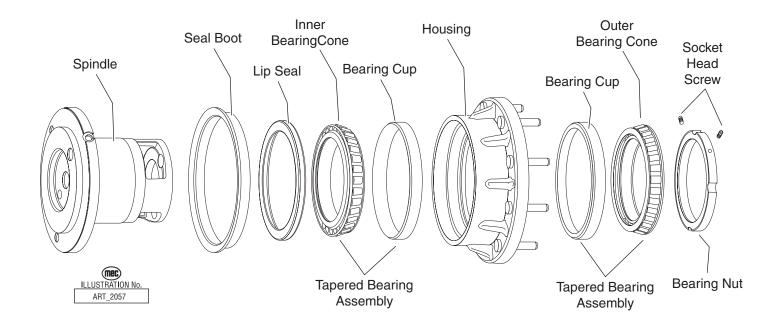




- 3. Remove the bearing nut;
 - Place the housing and spindle assembly on a clean surface with the spindle end down.
 - Remove the two (2) set screws and the bearing nut.
 - **NOTE:** The set screw holes in the bearing nut were staked to prevent the set screws from backing out. It will be necessary to clean up the holes prior to removing the set screws.
- 4. Remove the bearing cones;
 - Remove the outer bearing cone.
 - Turn the unit on its side and press the spindle out of the housing.
 - Remove the inner bearing cone.
- 5. Remove the seal boot.
- 6. Remove the lip seal from the housing.

NOTE: Use a new seal when reassembling.

- 7. Remove the bearing cones;
 - Use a soft steel rod to knock both bearing cones out of the housing.





Assembly

NOTE: Spray a light film of oil on all component parts during assembly. Spray a generous amount of oil on bearings during installation.

- 1. Use a pressing tool to press both bearing cups into the housing.
- 2. Place the inner bearing cone into the inner bearing cup.
- 3. Grease the seal lip and use an appropriate tool to press the seal into the housing until it is flush with the end of the housing.
- 4. Place the spindle on the work surface, flange side down, and install the seal boot.
- 5. Lower the housing onto the spindle.
- 6. Place the outer bearing cone into the outer bearing cup.
- 7. Install the bearing nut;
 - Apply Loctite 243 on bearing nut thread and install the bearing nut.
 - Leave .003–.005 inches (.076–.127mm) end play to check the initial rolling torque with the unit tied down.
 - ◆ Torque the bearing nut until the rolling torque is 40–50 In. Lbs. (4–5 Nm) greater than initial rolling torque.
 - **NOTE:** Final torque is initial rolling torque plus 40–50 in. lbs. (4–5 Nm). E.g., if the initial rolling torque is 30 in. lbs. (3.5 Nm), the final rolling torque is 70–80 in. lbs. (8–9 Nm). Be sure the torque wrench is tangent to the housing OD.
- 8. Install the set screws into the bearing nut threaded holes.
 - Make sure set screw is driven into the spindle thread.
 - Tighten the set screws to damage the thread.
 - Stake the edge of the nut around the set screws so the nut will not loosen.
- 9. Place thrust washer into the counter-bore of the spindle.
- 10. Install planet gear subassemblies;
 - Place a planet gear subassembly into the spindle and align the planet gear bore with a planet shaft hole.
 - Insert a planet shaft (roll pin hole *up*) into the planet shaft hole and through the planet gear subassembly with.
 - Use a punch or similar tool to align the roll pin holes on the shaft and spindle.
 - Being careful not to strike the planet gears, drive the roll pin into the roll pin holes until the pin is flush with the OD of the spindle.
 - Repeat for the remaining planet gear subassemblies.
- 11. Grease the O-ring and place it into the groove on the housing.
- 12. Place the ring gear subassembly onto the housing and spindle assembly.

• Align the three (3) cap screw holes.

Install the cap screws and torque to 15–20 ft. lbs. (20–27 Nm).



Steer Cylinder

There are two (2) double acting type steer cylinders on this machine. During operation, cylinder(s) should not leak, but a slight damping at the rod seal is acceptable. The pins should be checked for wear.

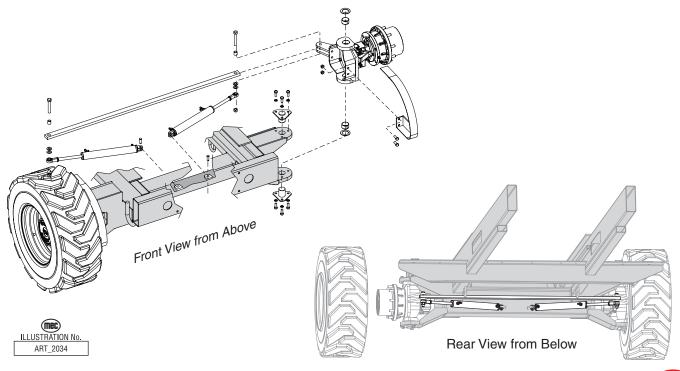
To replace steer cylinder:

CAUTION: • Clean all fittings before disconnecting hoses.

- Tag hoses for proper reassembly.
- Plug all openings to prevent contamination.
- 1. Raise and support the front end of machine (see Intro Section Raising the Machine).
- 1. Disconnect hydraulic hoses and cap them.
- 2. Remove the nut and bolt holding the steer cylinder to the motor mounting bracket.
- 3. Remove the pin and cotter pin holding the steer cylinder to the front axle.
- 4. Carefully lift off the steer cylinder.
- 5. Position the new steer cylinder and install pin and cotter pin to hold cylinder to the front axle.
- 6. Install nut and bolt to hold cylinder to motor mounting bracket.
- 7. Connect hydraulic hoses.
- 8. To purge air from cylinder;
 - place a suitable container beneath the hose connections to catch spilled fluid,
 - loosen hose fittings slightly,
 - actuate steer function,
 - when all air is purged, tighten hose connections.

Steer Cylinder Seal Replacement

Refer to Section 1 for seal replacement instructions.





Floating Axle Lock Cylinder

There are two Floating Axle Lock Cylinders located at the rear of the machine.

Remove

- 1. Raise and support the front end of machine (see Intro Section Raising the Machine).
- 2. Remove the bolt that secures the long clevis pin to the frame and remove the clevis pin.
- 3. Remove the bolt that secures the short clevis pin to the floating axle and remove the clevis pin.

Replace

Installation is reverse of removal. Apply one (1) drop of Loctite® to the bolts that secure clevis pins.

Bleed Procedure

- 1. Relocate the upper control box from the platform to a ground access point.
- 2. Loosen the bleed valve located on the top of the cylinder.
- 3. Operate drive very slowly while watching air escape from valve.
 - Once a steady stream of fluid runs from the valve, release drive and tighten the valve.
- 4. Repeat on opposite side.

Test Locking and Center Position

- 1. Place a block approximately 4 inches (10 cm) high behind one of the rear tires.
- 2. Elevate the platform to 10 feet (3 m).
- 3. Slowly drive the tire onto the block.
- LEFT The axle lock cylinders should be locked (no movement). RIGH The opposite tire should be off the ground. Þ. 4. Lower the platform. 0 The axle lock cylinders should Axle Lock release. Cylinder The suspended tire Centering Switch should lower to the Nylon ground. Washers Nylon 6 Axle Guide Clevis Pin Bearing (5/8" x 2 1/8") Bearing Pivot Pin Motor and Torque Hub mec JSTRATION ART 2058



"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

Clevis Pin (5/8" x 5 1/4")

Hoses and Cables

Note: Refer to *Parts Section E* for detailed hydraulic hose diagrams.

Inspect all hoses and electrical cables for security and damage. Hoses and cables should be examined for rubbing and chafing.

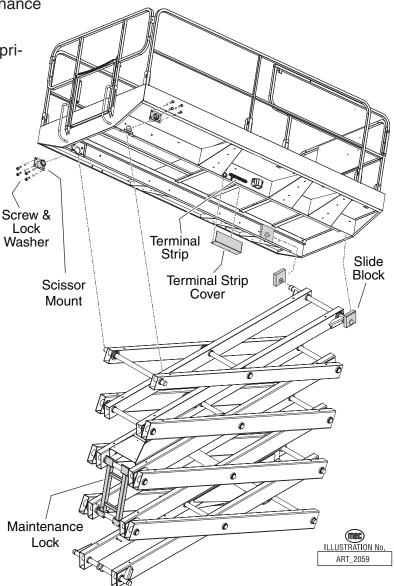
Check for leaks at fittings. Replace any damaged hose or cable.

- 1. Tag hoses for proper reassembly.
- 2. Disconnect hoses and IMMEDIATELY cap the openings to prevent contamination.
- 3. Torque hose fittings according to the Hydraulic Torque Specification Table.

Platform Removal

- 1. Raise platform and set the maintenance lock.
- 2. Connect overhead crane by appropriate lifting device to platform.
- 3. Disconnect all platform wires.
- 4. Remove the bolts from both platform scissor mounts at the rear of the machine, and remove the scissor mounts.
- 5. Slide platform and roll out deck off the machine.

Installation is reverse of removal. Apply one (1) drop of Loctite® to all bolts.



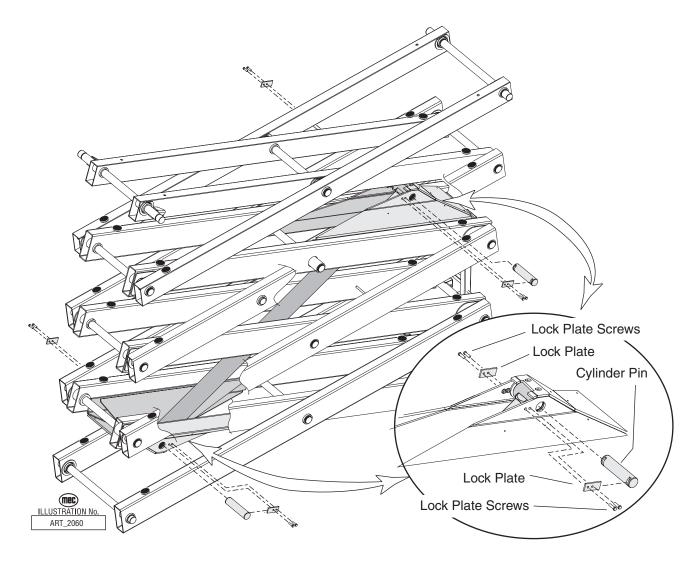


Lift Cylinder Removal and Installation

Note: Refer to *Section 1* for seal replacement instructions. Refer to *Parts Section C* for detailed parts list and illustration.

- **CAUTION:** Clean all fittings before disconnecting hoses.
 - Tag hoses for proper reassembly.
 - Plug all openings to prevent contamination.
 - Cylinders are heavy. Provide proper support before removing pins.
 - Attach the lifting device to the cylinder body. Lifting by either end will cause the cylinder to extend.
- 1. Raise the scissor arm assembly and support using the maintenance lock.
- 2. Disconnect hoses and wires and cables to the lift cylinder(s).
- 3. Use a suitable device to support the lift cylinder.
- 4. Remove lock plates and cylinder pins.
- 5. Guide the cylinder through the end of the scissor assembly and lift by the body using a suitable lifting device.

Installation is reverse of removal. Apply one (1) drop of Loctite® to all bolts.





Scissor Beam Assembly

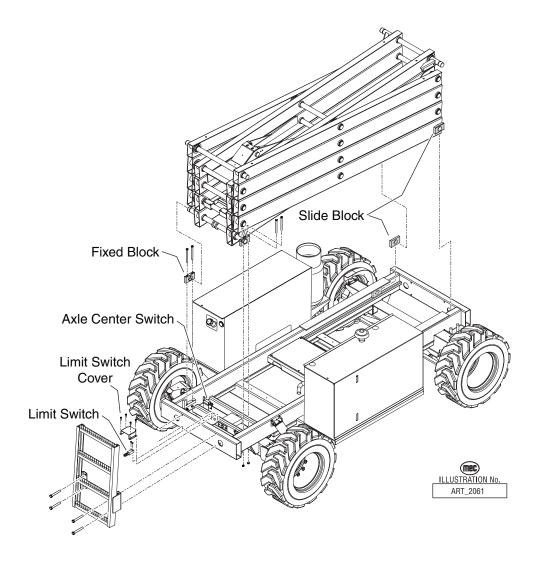
Note: Refer to Parts Section C for detailed parts list and illustration.

Clean the beams once a year or as necessary and inspect along the beam's surface, especially welds and brackets.

Scissor Beam Removal

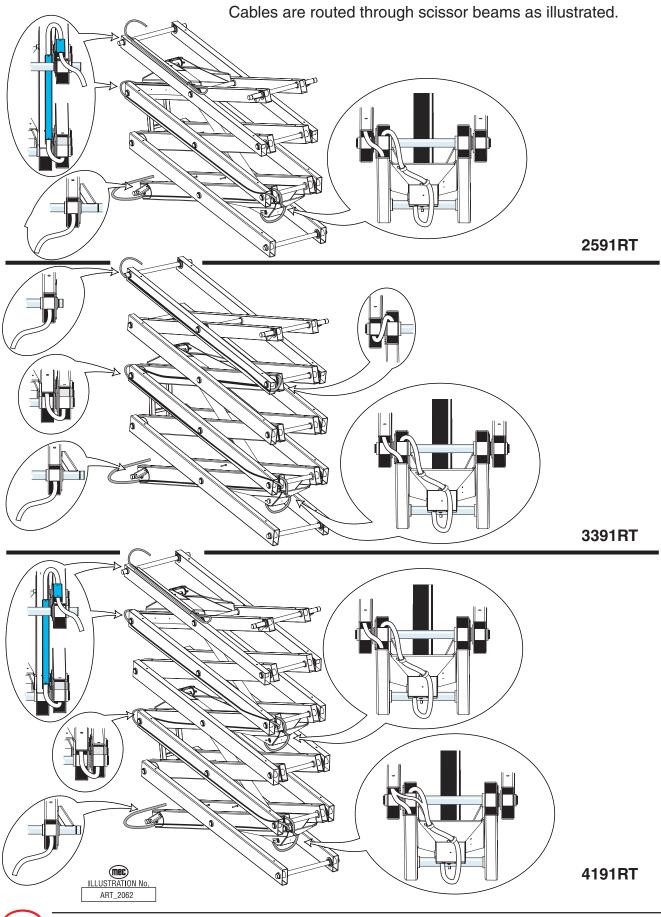
- 1. Remove the platform and lift cylinder(s).
- 2. Attach a suitable lifting device to the scissor assembly.
- 3. Remove the Limit Switch cover and Limit Switch.
- 4. Remove the bolts from both fixed blocks at the rear of the machine.
- 5. Slide and lift the scissor assembly

Installation is reverse of removal. Apply one (1) drop of Loctite® to all bolts.





Cable Routing





ENGINE MAINTENANCE

Diesel Engine



Always wear protective eye-wear when working with fuel and oil. Engine should be OFF when replacing filter elements.

For complete service information consult the engine manual that came with the machine.

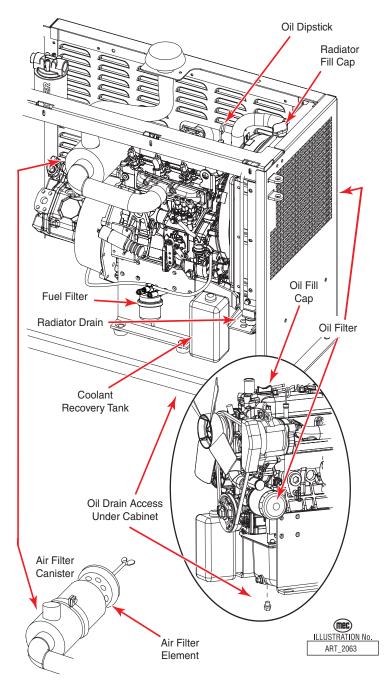
Oil and Oil Filter- Diesel

Dispose of used oil and filters properly.

- Use a suitable container to catch drained oil. Remove the drain plug. After oil has drained, replace the drain plug.
- 2. Remove the old filter and wipe the filter seal contact surface with a clean towel. Coat the seal on the new filter with clean oil, then install and tighten by hand.
- 3. Fill engine with 10w-30 motor oil until the dipstick indicates FULL. Capacity is 5.4 US quarts (5,1 l).
- 4. Recheck dipstick after running engine. Fill as necessary.

Air Filter Element- Diesel

- 1. Remove the hoses from the canister.
- 2. Loosen the bracket and remove the canister.
- Remove the wing-bolt, remove old filter and replace with a new filter. Replace and tighten the wing-bolt. *Do not run the engine with the air filter element removed.*
- 4. Replace the canister and attach the hoses. Tighten the canister bracket and hose clamps.





Fuel Filter- Diesel

- 1. Turn OFF valve on bottom of fuel tank.
- 2. Place a suitable container beneath the fuel filter assembly to catch spilled fuel. Clean the filter area.
- 3. Turn filter cartridge ¼ counterclockwise remove. Wipe the filter seal contact surface with a clean towel and install a new filter.
- 4. Open valve at fuel tank and check for leaks.
- 5. Purge the air from the fuel system as follows;
 - Fill fuel tank to the fullest extent. Open valve on bottom of fuel tank.
 - Loosen bleed screw on top of fuel filter housing a few turns.
 - Close the bleed screw when there are no more bubbles.
 - Open the bleed screw on the fuel injector pump. Use the lift pump hand lever to pump fuel to the injectors. Close the bleed screw when there are no more bubbles.

Do not attempt to start the engine until Step 5 has been performed.

6. If fuel becomes contaminated with water, use the Water Separator Valve at the bottom of the fuel cartridge to drain water.

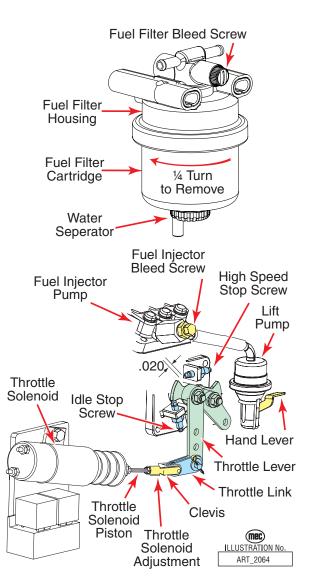
Idle Speed Adjustment - Diesel

- 1. Bring engine to operating temperature.
- 2. Slow engine to complete idle.
- 3. Adjust the Idle Stop Screw until the RPM is 950. Adjust slightly up or down to avoid vibrations.
- 4. Hold the Idle Stop Screw while tightening the jam nut to prevent change in adjustment.

High Speed Adjustment - Diesel

IMPORTANT: In order to prevent electrical system damage, check the Throttle Solenoid Adjustment after this procedure.

- 1. Bring engine to operating temperature.
- 2. Disconnect the Throttle Solenoid linkage at the clevis.
- 3. Manually pull the Throttle Lever until it contacts the High Speed Stop Screw.
- 4. Adjust the High Speed Stop Screw until the RPM is 3200 with the Throttle Lever against the High Speed Stop Screw.
- 5. Turn off the engine and reconnect the Throttle Solenoid linkage at the clevis.
- 6. Hold the High Speed Stop Screw while tightening the jam nut to prevent change in adjustment.

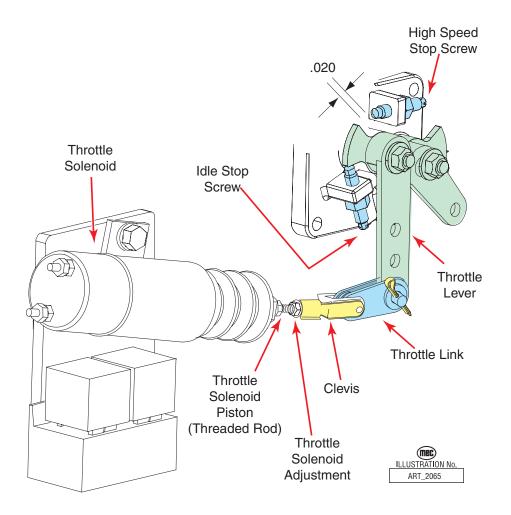




Throttle Solenoid Adjustment - Diesel

IMPORTANT: This final adjustment must be made after all other throttle speed adjustments. The solenoid must be free to retract fully in order to turn OFF the High Amperage Pull Circuit. Improper adjustment will result in solenoid failure and may damage the electrical system.

- 1. With the engine OFF, manually retract the solenoid by grasping the piston, just ahead of the boot, and pull to the fully retracted position.
- 2. With the solenoid piston fully retracted measure the distance between the High Speed Stop Screw and the Throttle linkage using a .020 feeler gauge.
- 3. Adjust clearance at the Throttle Solenoid linkage only. *Do not adjust the High Speed Stop Screw.*
 - Disconnect the linkage at the clevis and turn the clevis to lengthen or shorten as necessary.
 - Reconnect the clevis and measure again. Repeat until the measurement is correct.





Gasoline and Dual Fuel Engine

Always wear protective eye-wear when working with fuel and oil. Engine should be OFF when replacing filter elements.

For complete service information consult the engine manual that came with the machine.

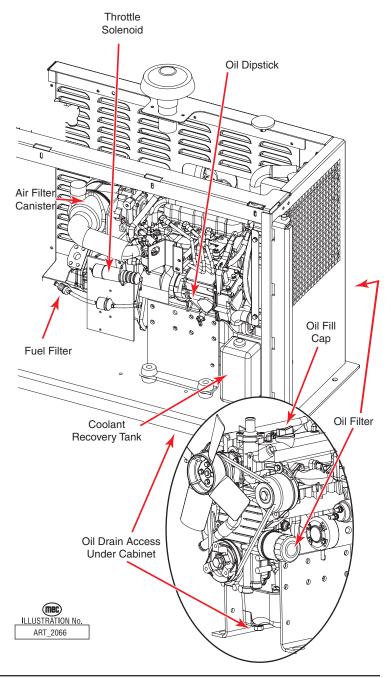
Oil and Oil Filter - Gasoline and Dual Fuel

Dispose of used oil and filters properly.

- 1. Use a suitable container to catch drained oil. Remove the drain plug. After oil has drained, replace the drain plug.
- 2. Remove the old filter. Coat the seal on the new filter with clean oil, then install and tighten by hand.
- Fill engine with 10w-30 motor oil until the dipstick indicates FULL. Capacity is 3.4 US quarts (3,25 l).
- 4. Recheck dipstick after running engine. Fill as necessary.

Fuel Filter - Gasoline

- 1. Turn OFF valve at fuel tank.
- 2. Loosen the hose clamps on the fuel lines and slide them away from the in-line fuel filter.
- 3. Remove the in-line fuel filter from the fuel lines.
- 4. Install a new in-line fuel filter.
 - There is an arrow, indicating direction of flow, on the body of the in-line fuel filter. Make sure that the arrow points *from* the fuel tank and *to* the engine.
- 5. Reposition and tighten the hose clamps.
- 6. Open valve at fuel tank and check for leaks.





Air Filter Element - Gasoline and Dual Fuel

- 1. Unlock the catches holding the filter canister cover.
- 2. Remove the wing-nut from the filter assembly and remove the filter element.
- 3. Inspect the canister for debris and clean as necessary.
- 4. Install a new filter element and tighten the wing-nut.
- 5. Replace the canister cover and lock the catches.

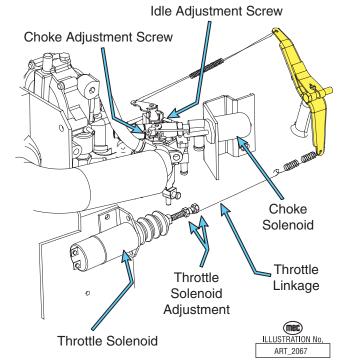
Engine Adjustment - Gasoline and Dual Fuel

The following adjustment points are sealed by the factory and cannot be adjusted.

- Carburetor Pilot Screw
- LPG Main Pressure Adjustment Screw
- LPG Idle Pressure Adjustment Screw
- Distributor Ignition Timing Adjustment Screw

Choke Adjustment - Gasoline and Dual Fuel

- 1. Loosen the Choke Adjustment Screw until the linkage rod can move freely.
- 2. Manually retract the Choke Solenoid Piston until it stops.
- 3. While holding the solenoid fully retracted, close the choke plate until it stops in the fully closed position.
- 4. Allow the choke plate to open slightly and tighten the Choke Adjustment Screw.



5. Check Choke Solenoid operation to ensure that the choke plate travel does not prevent the Choke Solenoid from retracting fully.

Idle Speed Adjustment - Gasoline and Dual Fuel

- 1. Bring the engine to operating temperature.
- 2. With the engine at idle, adjust the Throttle Stop Screw until the engine RPM is 1350±50.

High Speed Adjustment - Gasoline and Dual Fuel

- 1. Bring the engine to operating temperature.
- 2. Loosen the adjusting nuts on the Throttle Solenoid.
- 3. Have an assistant press the Throttle Button on the Lower Controls panel.
- 4. Adjust the nuts on the Throttle Solenoid Piston until the engine RPM is 3850±50.
- 5. Tighten the nuts to secure the adjustment.



OUTRIGGER FUNCTION

The outriggers on the RT series MEC Scissor Lifts are a One-Touch Activation system. To deploy the outriggers, simply push the outrigger toggle switch down until the outriggers level the unit and the engine returns to idle. You are now ready to lift the platform. The outrigger control module is a "smart" unit, which will level the unit in all but extreme terrain so you don't have to attempt to level it yourself.

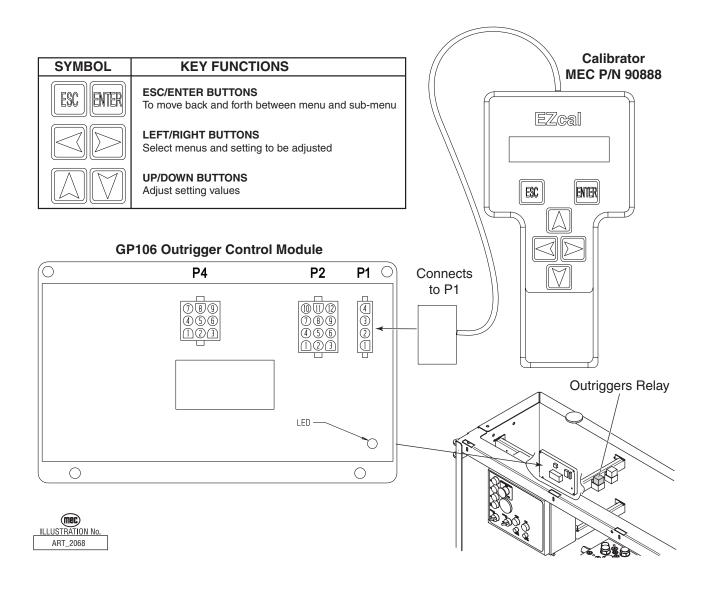
Operational Characteristics

- To deploy the outriggers, push the Outrigger Switch down and hold until the engine returns to idle. The unit will self-level.
- The outrigger legs can not be operated individually.
- The outriggers system will not operate when the platform is elevated above approximately 10 feet (3 m).
- Travel is locked out when the outriggers are deployed. A Drive Indicator Light, above the outrigger switch, will illuminate when the outriggers are fully retracted.
- The engine will not return to idle when the outriggers are fully retracted. The drive indicator light is your signal that the outriggers are fully retracted.
- If the slope of the terrain is in excess of the outrigger's leveling capabilities, the outrigger control system will continue to attempt to level and the engine will not return to idle. In this case, if the platform remains outside of the pre-described tilt sensor parameters, the unit will not elevate above 6 feet 2 m) and the alarm will sound, indicating the out-of-level situation.
- The outrigger system uses a Top-out limit switch and a Pressure switch on each leg to monitor their respective positions.
- Each outrigger leg uses a Retract valve and an Extend valve to control cylinder stroke. These are located under the protective cover atop the outrigger leg.
- A 4-way, 3-position valve, on the outrigger hydraulic manifold controls the direction of oil flow to the outrigger legs.
- The GP106 Outrigger Control Module controls all outrigger valve and interlock duties as well as sensing unit level.
- Diagnosis of the GP106 Outrigger Control Module is possible by counting the number of flashes from the red LED and referring to *Outrigger Module GP106 LED Flash Codes* at the end of this section. Diagnosis and calibration of the outrigger module can also be done through the use of the EZ-Cal scan tool MEC part # 90888. (See GP106 troubleshooting in this section)
- If the GP106 Outrigger Control Module is ever replaced or removed or if you suspect that it requires calibration, you must use the EZ-Cal scan tool and the following directions to calibrate the outrigger module.



Outrigger Calibration

Before attempting the calibration procedure, move the machine to an area that is level as measured by a spirit level or other leveling device. An EZ-Cal hand-held device (MEC part # 90888) is required to carry out all calibration procedures on the GP106 Outrigger Control Module.





Outrigger Tilt Sensor Calibration

The integral tilt sensor of the GP106 Outrigger Control Module must be calibrated to compensate for variations due to installation and vehicle construction. This procedure must be done if the control module is ever repositioned or replaced.

- a. Drive machine to level ground.
- b. Plug EZ-Cal into connector P1 on the control module. Display reads HELP: PRESS ENTER.
- c. Press right arrow to ACCESS LEVEL 3, Press Enter. Display reads CODE 0000.
- d. Press up and right arrows to enter code 1775, Press Enter. Display reads ACCESS LEVEL 2.
- e. Right arrow to MACHINE SETUP, Press Enter.

Display reads CHANGE DEFAULTS.

- f. Right arrow to CALIBRATE LEVEL, Press Enter. Display reads CALIBRATE LEVEL: YES:ENTER,NO:ESC.
- g. Press Enter. Display reads TILT 0.0',0.0'
- h. Press ESC, ESC
- i. Disconnect EZ-Cal from the outrigger control module.

Outrigger calibration is now complete.



GP106 Outrigger Control Module Troubleshooting

When the **EZ-Cal** hand-held device is connected to the **GP106** control module, the first menu available is "HELP" – just press the **ENTER** button to see a message describing the current status of the **GP106**; this can be very helpful in diagnosing problems with the system.

When an **EZ-Cal** is unavailable, an LED on the **GP106** flashes to provide limited diagnostics

The following messages might be displayed:

EVERYTHING OK

The **GP106** detects no problems.

If problems are being experienced with the system, use the DIAGNOSTICS menus to check for wiring problems.

B+ SUPPLY TOO LOW

The **GP106** is designed for use on 12V and 24V battery powered vehicles; it cannot operate with a supply below about 9V.

The "BATTERY" voltage can be checked in the "SYSTEM" menu (available in the "DIAGNOSTICS" menu).

CANNOT LEVEL: BAD TILT SENSOR

Ensure that the **GP106** is correctly installed – if it is wrongly oriented, its integral tilt sensor will be unable to measure vehicle tilt correctly.

CHECK OUTRIGGERS SUPPLY (P4-9)

An auto-level or auto-retract signal has been detected by the **GP106** (on P2-5 or P2-6) but there is no supply on P4-9 to power the outrigger legs.

OUTRIGGERS MANUALLY CONTROLLED

The outrigger system cannot be manually controlled, but this message may appear. It indicates a wiring problem to terminal P2-2.

OUTRIGGERS CANNOT BE MOVED

The outrigger system will be unable to operate if the machine is on a steep slope greater than ten (10) degrees.

RELEASE OUTRIGGER DEMAND!

The **GP106** is waiting for an active signal on P2-5 or P2-6 to be released (due to activating a switch when power is applied, or in conjunction with manual use of the outriggers, or activating both switches together).

VEHICLE TILTED

Either the "X" or "Y" tilt (measured by the **GP106** integral tilt sensor) exceeds three degrees. This does not affect operation of outriggers.

OUTRIGGER WIRING FAULT

The system has detected voltage on P2-2 but voltage is not present on P2-5 or P2-6. Check wiring to P2-5/6.



Outrigger Module GP106 LED Flash Codes

The **GP106** has a built-in LED to provide simple diagnostics when no **EZ-Cal** is available. Please note that the use of an EZ-Cal provides significantly better diagnostics through the HELP messages listed previously.

LED on steady

This indicates power to, and no fault with, the GP106

LED off always

This indicates no power to the GP106

LED flash code 1

Wiring Fault. Check connection to P2-2.

LED flash code 2

This indicates a fault with the switch inputs to the **GP106**. Check wiring to connector P2.

LED flash code 3

This indicates a fault with the "stable" output of the **GP106** – a short to the supply has been detected. Check wiring from pin P2-8

LED flash code 4

This indicates that the outriggers cannot be operated because the machine is on a slope greater than ten (10) degrees. Move machine to a different location.

LED flash code 5

This indicates a fault with the "stable" output of the **GP106** – a short to 0V (ground) has been detected. Check wiring from pin P2-8

LED flash code 6

This indicates a fault with the "auto" inputs of the **GP106** – check the wiring to pins P2-5 & P2-6

LED flash code 7

This indicates a fault with the supply to the **GP106** – check battery supply at least 8V on pins P2-12 & P4-9

LED flash code 8

This indicates that the machine is not level. It is not a fault and will not affect operation of outriggers.

LED flash code 9

This indicates that the **GP106** is performing start-up tests.



Notes:

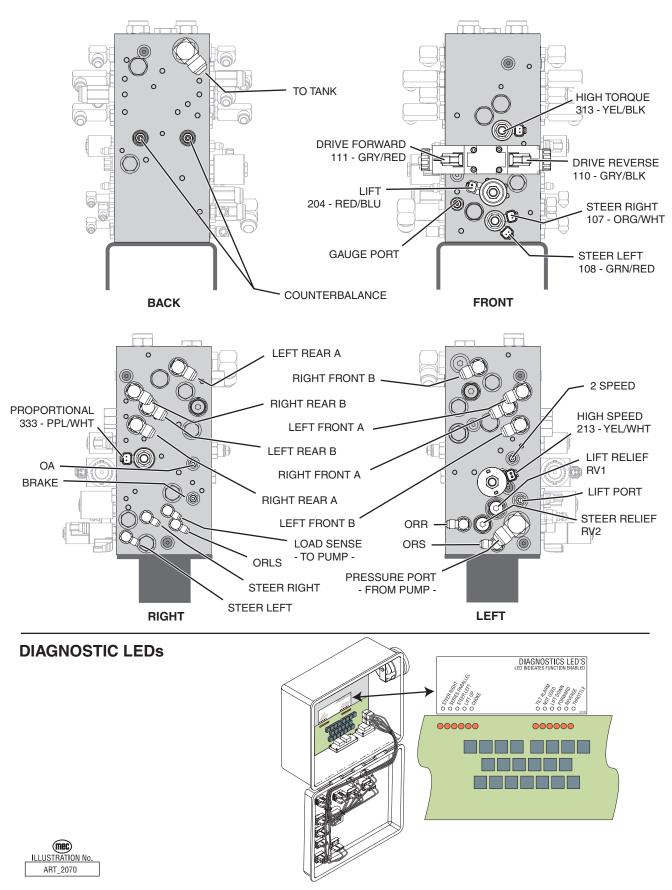




Froubleshooting	4-3
General Troubleshooting Tips	
Common Causes of Hydraulic System Malfunctions:	
lydraulic Pressure Adjustment Procedures	4-9
Proportional Speed Adjustment4	-12
Controls and Switches	-14



HYDRAULIC MANIFOLD





TROUBLESHOOTING

The 2591RT, 3391RT and 4191RT are designed for ease of diagnostics. There is a terminal strip located under the work platform for checking signals to and from Upper Controls. There are also LED's located in the Lower Controls box to indicate outputs from the circuit board.

Diagnostic Example: if the lift LED does not illuminate when attempting to lift, either the main power is not on, or board is not receiving a signal for lift. If LED is illuminated but machine does not lift, there would be an electrical problem between the Circuit board and the valve, or a hydraulic problem. The main valve block is equipped with a quick disconnect gauge port to help diagnose the hydraulic system.

General Troubleshooting Tips

Before investigating a malfunction, check the following items:

- Check that battery switch is turned on.
- Check that battery connections are secure and battery if fully charged.
- Check that the emergency stop button is released (UP/OUT position).
- Check that the hydraulic fluid is at the correct level.
- Check that the circuit breaker is in the "ON" position (not tripped).

Common Causes of Hydraulic System Malfunctions:

- Incompatible hydraulic fluids mixed, destroying the additives and causing varnish build up, resulting in the valves sticking.
- Water in the hydraulic fluid due to a damp climate.
- Improper hydraulic fluid used. Viscosity too high in cold climates. Viscosity too low in warm climates.
- Hydraulic fluid contaminated with debris filter change interval neglected.
 - **NOTE:** Mobil Fluid 424 Hydraulic Fluid, is a multiple viscosity fluid that is light enough for cold climates and resists thinning in warm climates. Only Mobil Fluid 424 or equivalent must be used. Substituting with a lower grade fluid will result in pump failure.

Following is a step by step basic troubleshooting guide.

NOTE: Contamination always causes failure in any hydraulic system. It is very important to be careful not to introduce any contamination into hydraulic system during the assembly procedures. Please make sure all ports and cavities of the manifold and cylinders are properly covered/plugged during maintenance activities.



PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION	
General Power Issue			
No operation from upper or	Main battery switch turned off	Located left of Lower Controls box	
Upper Control station	Emergency switch pushed in or Ignition switch turned off	Upper or lower Emergency Stop switch will cut all power as will the Ignition switch in the Platform Controls box	
	Dead Battery	Charge battery	
	Blown fuse	Sealed unit just below Lower Controls box	
	Circuit breaker tripped	Reset - Located in Lower Controls box panel	
	Damaged Upper Controls box harness	Inspect from harness plug to terminal strip under platform	
	Failed 25 AMP diode	Test/replace. Located inside Lower Controls box	
	Failed Power Relay on Circuit board	Replace circuit board in Lower Controls box	
Functions from Upper Controls but not from Upper	Faulty relay, located in Upper Controls box	Check power on wire 101 from Key switch Check power on wire 101A from relay to Joystick plug	
Controls	Interlock switch (Joystick)	Check power to RED wire (power to switch) and power to PURPLE wire (power out of switch) at Joystick plug	
Lift/Lower			
Platform will not Raise	Excessive weight on Platform	Reduce weight to within platform capacity	
	Lift Relief valve out of adjustment	Adjust relief valve to rated capacity	
	Lift Valve SV-1 not energized	Check lift circuit from Upper Controls box to SV-1 valve	
	Lowering valve SV-5 stuck open (located at base of lift cylinder CYL-1)	Check and remove contamination, E-Down cable damaged or replace valve	
	Level Sensor out of level (platform elevated above 6 feet)	Reposition machine to firm level surface, Check Level Sensor function	
	Main system pressure inadequate	Check pump output pressure (see <i>Hydraulic Pump Adjustment</i> in this section)	
	Proportional control out of adjustment (High Range Adjustment)	See Proportional Speed Adjustment in this section	
Platform will not Raise (with outriggers option)	All outrigger feet deployed but not firmly on ground.	Redeploy outriggers by pushing the outrigger switch down.	
	Outrigger pressure switch inoperative	Inspect all four outrigger pressure switches located on top of the outrigger legs.	
Platform will not lower or	Maintenance Lock in maintenance position	Return Maintenance Lock to the stowed position	
lowers slowly	Lowering valve not energized	Check lowering circuit from Upper Controls box to Lowering valve SV-5	
	Lowering valve not shifting	Clean debris, replace	
	Lowering orifice (ORF-3) plugged	Clean orifice	
Lowers but not completely (4191RT only)	Down valve on one cylinder inoperative	Check valve coils	
Emergency lowering not	E-Down cable broken or frayed (2591RT/3391RT)	Replace E-Down cable	
working	Lowering valve not shifting	Clean debris, replace	
	Lowering orifice (ORF-3) plugged	Clean orifice	
4191RT ONLY	E-Down battery discharged	Charge, check charge diode & connections	
	Valve coil failed on either cylinder	Test, replace	
Lowers but not completely	Down valve on one cylinder inoperative	Check valve coils, wiring <i>continued</i>	



PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Drive		
No drive function	Valve SVD1 not energizing	Check forward/reverse LEDs lighting up at circuit board inside Lower Controls box Check connections at valve Check voltage at valve Check ground to valve Check valve for proper functioning
	brakes not releasing	Check OPL5 brake orifice for contamination
	Proportional Control out of adjustment (High Speed adjustment)	See Proportional Controller Adjustment in this section
(with outriggers option)	Outriggers lowered	Check Drive Enable light - raise outriggers
	Outrigger Retracted switch/s inoperative	Check enable light on Platform Controls box Check outrigger switches located on top of each outrigger jack for continuity
No drive elevated	Proportional Control out of adjustment (Low Range adjustment)	See Proportional Controller Adjustment in this section
	Axle out of center or Axle Center switch inoperative	Lower platform and reposition o level ground. Inspect switch on level ground.
	Unit out of level	Lower and reposition the machine. Check Level Sensor malfunction
(with outriggers option)	Outriggers lowered	Check Drive Enable light - raise outriggers
Slow drive with Platform	High torque enabled	Check Speed/Torque switch in Platform Controls Box
stowed	Limit switch not functioning	Limit switch at rear center of base Check continuity between wire 2 TAN/ORG and wire 20 RED/ WHT. Continuity = platform stowed.
	Upper Controls circuit board running in slow speed mode	12 volts to "R" terminal on circuit board in Platform Controls box = High Range
	Proportional Control out of adjustment (Low Range adjustment)	See Proportional Controller Adjustment in this section
	Engine not running to full potential	Check engine operation as per engine manufacturer guidelines
	Wheel motor/s not functioning correctly	Inspect wheel motors for excessive bypass
	RV3 or RV4 not adjusted correctly	Check and adjust relief valves
Drive in one direction only	Rev-Up or FWD-Down micro-switch failure	Check micro-switches on Joystick controller for function or adjustment
	Drive valve SVD1 not energizing in one direction	Check 12 volts to appropriate coil, check coil, check valve function
	Counterbalance valve CBV1 or CBV2 not functioning correctly	Swap Counterbalance valves to see if functioning direction changes.
No low speed (high torque mode)	Speed/Torque selector switch inoperative	Check for 12 volts on terminals 2 & 3 of Speed/Torque switch in Platform Controls box with drive enabled
	Valve SV3 not functioning	Check for 12 volts and ground to valve Check for faulty valve spool
		continued



PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Drive		
No Mid Speed	SV3 or SV4 powered and/or shifted	These valves should not have 12 volts, in mid-speed, check valve function
	Speed/Torque selector switch malfunction	Should not have power at terminals 1 & 3 of Speed/Torque switch in Platform Controls box with drive enabled
No High Speed	Speed/Torque selector switch inoperative	Check for 12 volts on all terminals of Speed/Torque switch in Platform Controls box with drive enabled
	Faulty diode block DB1	Test DB-1 in Platform Controls box.
	Valve SV4 not functioning	Check voltage and ground to valve. Check for faulty valve spool. Should provide pressure to 2SP Port
Multi-Function		
No drive or Lift function from Upper Controls with steer operational	PWM circuit board in Platform Controls box not functioning correctly	Check battery + and - terminals at board. Check PWM output at A terminal. Check connections between A terminal and Proportional valve.
	Proportional valve malfunction	Check, for 1 AMP at valve during full Joystick stroke. Replace Proportional valve SP-1
	EC1 pressure compensation valve not functioning	Check, replace valve EC1
No steering With Drive operational	SV2 not functioning	Check voltage and ground to valve Check for faulty SV2 valve
	Faulty lift/drive selector switch	Check power on wire #25A on switch
	Faulty steer switch	Check switch in Joystick handle
	Steering Cylinder/s internal leakage	Check for internal leakage - repair
	RV1 steer relief valve not functioning	Check adjustment or replace
		continued



PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION	
Diesel Engine			
Starter inoperative	Battery Cables loose or corroded	Clean, tighten cables	
	Key switch not functioning	Check power to wire #20 at Key switch while cranking	
	Starter not functioning	Check power to YEL/RED #220 wire at starter, Check ground cable to engine bell housing	
	Circuit board relay failed	Check input on plug A pin-17, ORG/RED wire #20 on Lower Controls circuit board Check output on plug B pin-1, YEL/RED wire #220 on Lower Controls circuit board. <i>12 volts in - 0 volts out = replace circuit board</i>	
No Engine start:	Low diesel fuel level	Fill diesel tank, (see <i>Section 3</i> for Fuel Priming instructions)	
Starter operates	Fuel valve closed - located at fuel tank	Open valve	
	Air in injector lines	See Section 3 for Fuel Priming instructions	
	Fuel filter clogged	Replace fuel filter	
	Run solenoid not activating	Check power at WHT/BLK wire #320 from starter to run solenoid while cranking (WHT/BLK pull in, GRN/WHT hold wire)	
	Glow plugs inoperative	See "Glow Plugs Inoperative" in this section	
Engine starts but dies when	Faulty oil pressure switch	Check switch and wiring	
starter disengaged	Faulty Fuel solenoid	Check 12 volts on GRN/WHT wire #116 - Replace Fuel Solenoid	
Dual Fuel Engine - Gas Starter inoperative	Battery Cables loose or corroded	Clean, tighten cables	
	Key switch not functioning	Check power to wire #20 at Key switch while cranking	
	Starter not functioning	Check power to YEL/RED #220 wire at starter, Check ground cable to engine bell housing	
	Circuit board relay failed	Check input on plug A pin-17, ORG/RED wire #20 on Lower Controls circuit board Check output on plug B pin-1, YEL/RED wire #220 on Lower Controls circuit board. <i>12 volts in - 0 volts out = replace circuit board</i>	
No Engine start:	Low gas level	Fill gas tank	
Starter operates	Fuel valve closed - located at fuel tank	Open valve	
	Clogged Fuel Filter	Replace fuel filter, located on fuel hose below engine	
	Faulty fuel selector switch	Check power to BLK/WHT wire #23 while cranking engine	
	Faulty fuel shut off solenoid	Check power and ground at gas solenoid, Check solenoid operation located in float bowl	
	Faulty fuel pump	Check power and ground at fuel pump during engine crank. Check fuel pump operation	
		continued	



PROBLEM PROBABLE CAUSE		REMEDY/SOLUTION	
Dual Fuel Engine - LP			
Starter inoperative	Battery Cables loose or corroded	Clean, tighten cables	
	Key switch not functioning	Check power to wire #20 at Key switch while cranking	
	Starter not functioning	Check power to YEL/RED #220 wire at starter, Check ground cable to engine bell housing	
	Circuit board relay failed	Check input on plug A pin-17, ORG/RED wire #20 on Lower Controls circuit board Check output on plug B pin-1, YEL/RED wire #220 on Lower Controls circuit board. <i>12 volts in - 0 volts out = replace circuit board</i>	
No Engine start:	Propane tank empty or valve closed	Fill tank - open valve	
Starter operates	Faulty carburetor mounted Propane solenoid	Check power and ground at Proportional solenoid, Check solenoid operation	
	Faulty propane shut off solenoid	Check power and ground at Shut-off solenoid, Check solenoid operation	
	Faulty fuel selector switch	Check power to BLU/WHT wire #22 while cranking engine	
	Clogged Propane Filter Located under the propane tank shelf	Turn Off Propane valve before filter inspection or replacement	
Engine runs rough, no	Vapor withdrawal tank installed	Replace tank with Liquid withdrawal type	
power, poor throttle response	Low engine coolant level	Check, add coolant.	
	Clogged Propane Filter Located under the propane tank shelf	Turn Off Propane valve before filter inspection or replacement	
	Propane regulator malfunction	Replace Propane Regulator	
Throttle, Choke & Glow Plugs			
Throttle does not operate	Maladjusted Throttle Solenoid (maladjusted throttle solenoid will result in the failure of the solenoid)	Adjust throttle linkage NOTE: throttle linkage adjustment is critical on diesel engine)	
	Throttle Solenoid failure	Check + and - to solenoid while operating Throttle	
	Throttle Relay (located on side of engine)	Test for 12 volts on RED wire #00 and ORG wire # 225 while throttle is requested <i>Power on these wires should = 12 volts on ORG/BLK wire 325</i>	
	Failed diode block (Large) located in Upper Controls box	Test and/or replace diode block Check for Throttle LED on Upper Control board	
Throttle does not remain energized	Failed Throttle solenoid	Replace Throttle Solenoid	
Choke does not operate	Choke Solenoid failure	Check + and - to solenoid while operating Choke	
	Failed Choke switch	Try Choke switch on opposite control panel Check for Choke LED on Lower Controls circuit board	
Glow Plugs inoperative	Failed Glow Plug Switch	Try Glow Plug switch on opposite control panel, Check for LED on Lower Controls circuit board.	
	Failed Glow Plug Relay - located on side of engine	Test for 12 volts on RED #00 wire and on ORG/WHT wire #124 while operating glow plugs. <i>Power on these wires should = 12 volts on ORG/BLU wire 224</i>	
	Failed glow plugs	Check for 12 volts at glow plugs while operating glow plugs.	
		end Trouble Table	

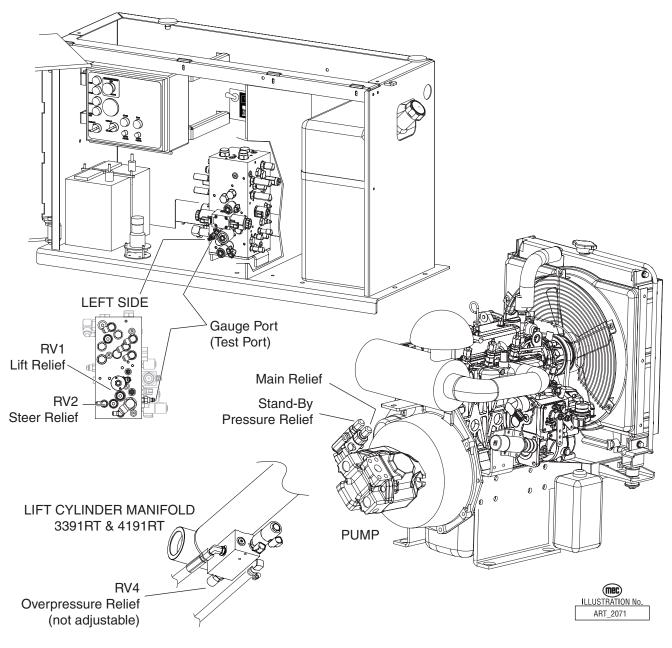


HYDRAULIC PRESSURE ADJUSTMENT PROCEDURES

- Before attempting to check and/or adjust pressure relief valves, operate the machine for 15 minutes or long enough to sufficiently warm the hydraulic fluid.
- Insert a 0-5000 psi gauge onto the pressure test port on the valve manifold using gauge adapter fitting MEC part no. 8434

Pressure Adjustment Table

MODEL	MAIN (PUMP)	LIFT (MANIFOLD RV1)	STEER (MANIFOLD RV2)	STAND-BY (PUMP)
2591	3000 PSI 207 bar	2500 PSI 172 bar	1500 PSI 103 bar	500-550 PSI 35-38 bar
3391RT	3000 PSI 207 bar	2650 PSI 183 bar	1500 PSI 103 bar	500-550 PSI 35-38 bar
4191RT	3000 PSI 207 bar	2500 PSI 172 bar	1500 PSI 103 bar	500-550 PSI 35-38 bar





Pump Adjustment

The Hydraulic Pump used in this model is a Variable Displacement, Pressure Compensated, Piston type pump. Proper adjustment is critical for normal operation of the machine. The following paragraphs will guide you through the various steps however, you must perform all steps, in their listed sequence, in order to achieve proper adjustment and machine performance.

Main Relief and Standby Pressure Adjustments

- 1. Start engine and operate the unit for 15 minutes or until the hydraulic fluid is warm.
- 2. Insert a 0 5000 PSI (0-345 bar) gauge onto the manifold pressure gauge port.
- 3. Remove the acorn nut from the Main Relief adjustment screw. Loosen the jam nut and turn the screw counterclockwise 3 turns. Tighten the jam nut and install the acorn nut.
- 4. Remove the acorn nut from the Standby adjustment screw and loosen the jam nut. Turn the screw clockwise 3 turns or until the needle on the gauge stops climbing. At this point the gauge is reading full main relief pressure.
- 5. Access the Main Relief screw again and adjust it until the gauge settles at 2800 PSI (193.5 bar). Tighten the jam nut and install the acorn nut.
- 6. Check the gauge reading again to ensure the setting did not change.
- 7. Turn the Standby adjustment screw counterclockwise until the gauge reads 550 PSI (38 bar). Tighten the jamb nut and install the acorn nut.
- 8. Check the gauge reading again to ensure the setting did not change.

Pump Displacement Adjustment

This adjustment is set at the factory and should not be tampered with. The Displacement adjustment controls the maximum amount of fluid flow that the pump will produce per revolution. Excessive flow will result in severe engine loading and stalling. Reduced flow will result in slower functions with no engine loading. If you suspect that the sitting is incorrect, please call MEC Product Support at (800) 387-4575 for assistance.

Lift Relief (RV1)

The Lift Relief valve is located on the left-side, center of the valve manifold. It will be necessary to remove the cap from the relief valve if adjustment is necessary. REMOVING THE CAP WHILE THE ENGINE IS RUNNING WILL RESULT IN FLUID LEAKAGE.

To check Lift Relief valve setting, park the machine on a firm level surface free from overhead obstructions. Using the lift switch on the lower panel, elevate the platform to full elevation. While maintaining the lift command, record the reading on the gauge.

Steering Relief (RV2)

The steering Relief value is located on the left side, lower of the value manifold. It will be necessary to remove the cap from the relief value if adjustment is necessary. REMOVING THE CAP WHILE THE ENGINE IS RUNNING WILL RESULT IN FLUID LEAKAGE.

To check Steering Relief valve setting, operate steer in one direction. While maintaining the steer command, record the reading on the gauge.



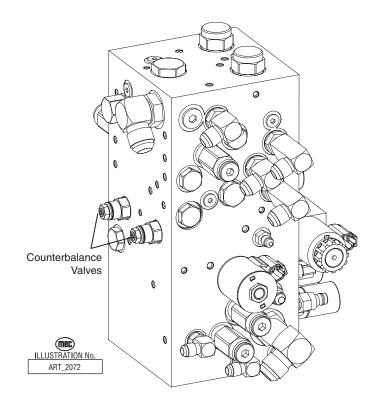
Lift Cylinder Overpressure Valves (RV4) 4191RT Only

The Lift Cylinder Overpressure valves are located on each of the lift cylinder valve blocks on the 4191RT model only.

Proper valve adjustment is not possible by the consumer. Considering their importance to the safe operation of the machine, they must not be tampered with. If the valve is suspected to be out of adjustment or tampered with, it must be replaced.

Setting Counterbalance Valves

- 1. Loosen the locknut on one of the valves.
- 2. Turn the adjustment screw clockwise (to the right) until it reaches the internal stop and the screw will turn no further.
- 3. Tighten the locknut while holding the adjustment screw in position to prevent it from rotating.
- 4. Repeat steps 1 through 4 on the other Counterbalance valve.
- 5. Adjustment is complete.





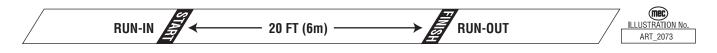
PROPORTIONAL SPEED ADJUSTMENT

Proportional Circuit Board Adjustment should only be performed after all other components are deemed to be in proper working order.

There are many factors that may contribute to excessively fast or slow drive speeds. Proportional Circuit Board Adjustment should only be performed after all other components are deemed to be in proper working order and not contributing to abnormal driving speeds. Failure to do so may result in incorrect speeds once the offending component has been repaired.

Circuit Board Setting Test Procedure

Before you begin, ensure there are no overhead obstructions preventing lift to full height. Lay out a course measured at 20 feet (6 meters) long. Ensure there are no obstructions preventing a straight travel over the distance of the course including leading up to and away from the course. Try not to steer while driving the timed course.



High Speed Drive Test:

With the platform fully lowered, drive the machine over the course, crossing the start line at full speed. Record the time it takes for a (predetermined) point on the machine to cross both lines and compare with the chart below using the 'High Range' column figure.

Elevated Speed Drive Test:

Elevate the platform above 12 feet (3.6 meters). Drive the machine over the course, crossing the start line at full speed. Record the time it takes for a (predetermined) point on the machine to cross both lines and compare with the chart below using the 'Low Range' column figure.

Speed Adjustment Table: 20 ft. (6 m) Course

TRIM POT	TRAVEL TIME IN SECONDS
High Range	3.5 to 4.0
Low Range	27 to 33

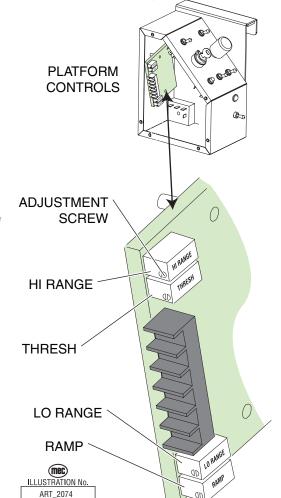


Adjustment Procedure

Note: Proportional Controller adjustments should only be made when the possibility of unauthorized tampering exists or after the Proportioning Valve or Proportional Circuit board was replaced. Though testing the proportional output should be part of routine maintenance, adjustments should not be necessary as a routine maintenance procedure.

The Trim Pots are located in the Platform Controls box (see illustration).

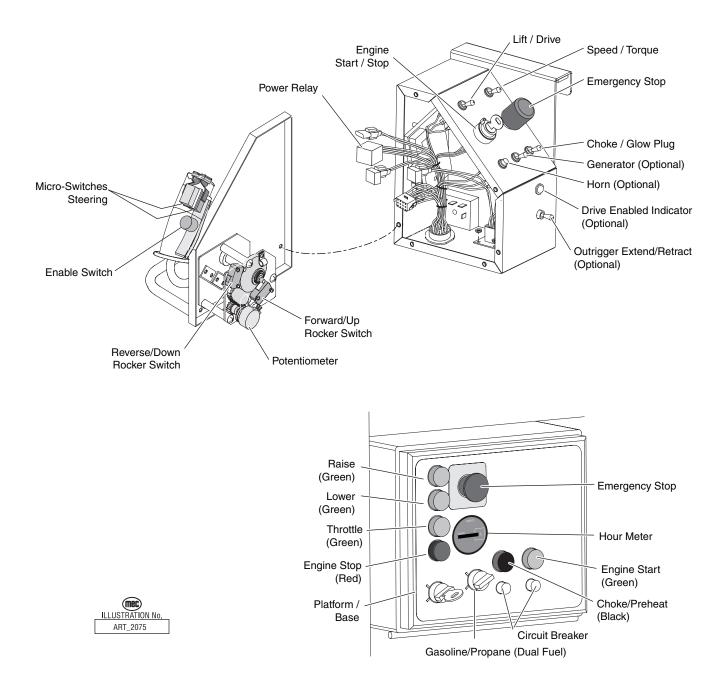
- 1. Turn the RAMP trim pot counterclockwise until a clicking noise is heard.
- 2. Ensure there are no overhead obstructions preventing lift to full height. Select LIFT mode, pull the enable and move the Joystick in reverse slowly to the point that the engine accelerates and hold it at that point. While holding the Joystick in that position, adjust the THRESH trim pot until the platform does NOT lift. Once adjusted, slight additional reverse motion of the Joystick should result in very slow and controlled lift action.



- Counterclockwise trim pot adjustment increases the amount of Joystick travel before platform movement.
- Clockwise trim pot adjustment will allow platform movement sooner in the Joystick travel.
- 3. If the machine was slow in the High Speed portion of the test, turn the HI RANGE trim pot clockwise until a clicking noise is heard.
- 4. If the Elevated Speed Drive Test resulted in speeds other then those listed, turn the LO RANGE trim pot clockwise to increase elevated drive speed or counterclockwise to decrease elevated drive speed to the proper speed. Repeat the Elevated Speed Drive Test.
- 5. The RAMP trim pot controls the smoothness of the motion start-up and linear ramp-up response. Turn the RAMP trim pot clockwise until the slowest machine start-up can be achieved while maintaining good proportional ramp-up through the travel of the Joystick.



CONTROLS AND SWITCHES





SECTION 5: SCHEMATICS

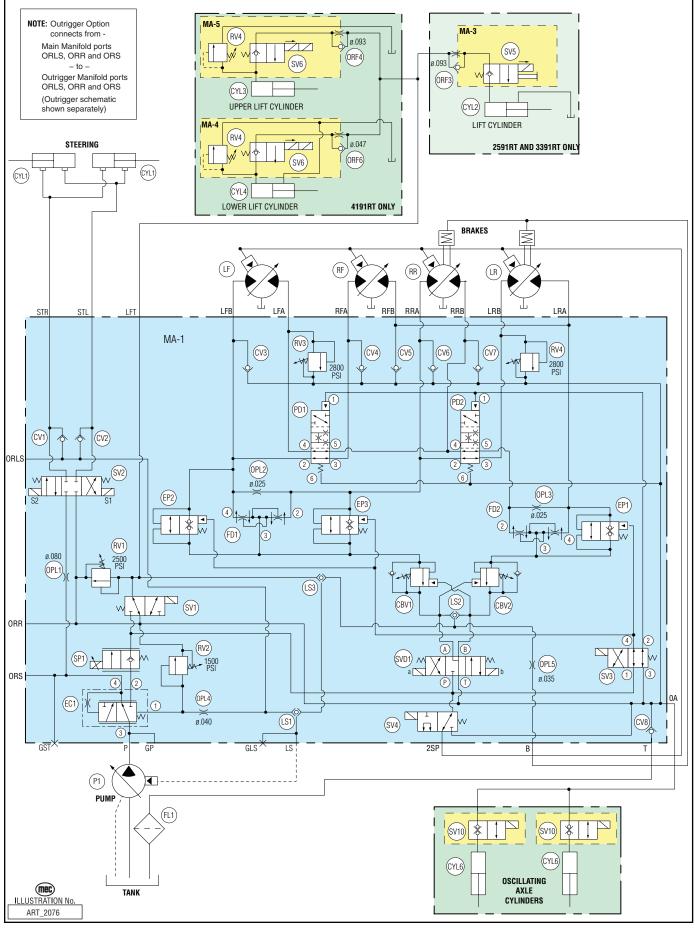
Hydraulic Schematic	5-2
Main Hydraulic Manifold	
Optional Outriggers	5-5
Electric Schematics	
Wire Harness Connections	
Main Wiring Harness	5-7
Circuit Board Schematic	
Upper Controls	5-10
Upper Controls - With Outriggers	
Lower Control Box	
Diesel Engine	5-13
Dual Fuel Engine	5-14
Optional Outriggers	
Optional Generator	5-16



HYDRAULIC SCHEMATIC

Callout	Description	Callout	Description
	Lift Cylinder Components (2591RT/3391RT)		Main Manifold Components
CYL2	Cylinder	MA1	Manifold, Main Valve Block
MA3	Manifold, Lift Cylinder	SVD1	Spool Valve, Drive, 4 Way - 3 Position
SV5	Solenoid Valve - 12V Cable Attach	SV1	Spool Valve, Lift, 3 Way
ORF3	Orifice - 0.093	SV2	Spool Valve, Steer, 4 Way - 3 Position
	Lift Cylinder Components (4191RT)	SV3	Spool Valve, Series Parallel, 4 Way - 2 Position
CYL3	Cylinder, Upper	SV4	Spool Valve, High Speed, 3 Way - 2 Position
MA5	Manifold, Lift Cylinder, Upper	SP1	Proportional Valve - 12V
SV6	Solenoid Valve - 12V Dual Coil	RV1	Relief Valve, Lift - 2500 PSI
RV4	Relief Valve - 3200 PSI	RV2	Relief Valve, Steer - 1500 PSI
ORF4	Orifice - 0.093	RV3	Relief Valve, Front Drive Motors - 2800 PSI
CYL4	Cylinder, Lower	RV4	Relief Valve, Rear Drive Motors - 2800 PSI
MA4	Manifold, Lift Cylinder, Lower	PD1 - PD2	Piloted Spool Valve, 4 Way - 3 Position
SV6	Solenoid Valve - 12V Dual Coil	EP1 - EP2 - EP3	Piloted Poppet Valve, Flow Divider Bypass
RV4	Relief Valve - 3200 PSI	LS1 - LS2 - LS3	Load Sense Shuttle Check Valve
ORF6	Orifice - 0.047	CBV1 - CBV2	Counter Balance Valve
01110		CL1	Coil, Series 8 - 12V
	Wheel Motor Components	CL2	Coil, Series 10 - 12V
LF	Wheel Motor - Dual Displacement (Left Front)	CL3	Coil, Series 10 E-Coil - 12V
LR	Wheel Motor - Dual Displacement (Left Rear)	FD1 - FD2	Flow Divider / Combiner
RF	Wheel Motor - Dual Displacement (Right Front)	EC1	Pressure Compensator
RR	Wheel Motor - Dual Displacement (Right Rear)	CV1 - CV2	Check Valve, Load Sense
P1	Pump - Variable Displacement Pressure Compensated	CV3 - CV7	Check Valve, Anti Cavitation
	Pressure Compensated	CV8	Check Valve, Tank Return
FL1	Return Filter - 10 Micron	OPL5	Orifice Plug, Brake - 0.035
		OPL1	Orifice Plug, Steer - 0.080
CYL1	Cylinder, Steering	0PL2 - 0PL3	Orifice Plug, Flow Divider Bleed - 0.040
	Oscillating Axle Components	OPL4	Orifice Plug, Compensator Bleed - 0.093
CYL6	Axle Lock Cylinder		
SV10	Solenoid Valve, Poppet N.C.		
	Optional Outriggers Components		
MA6	Manifold, Outriggers		
CV1 - CV2	Check Valve		
CYL5	Outrigger Cylinder		
SV7	Solenoid Valve, Poppet N.C.		
SV8	Solenoid Valve, Poppet N.C.		
SV9	Spool Valve, 4-way - 3-Position		

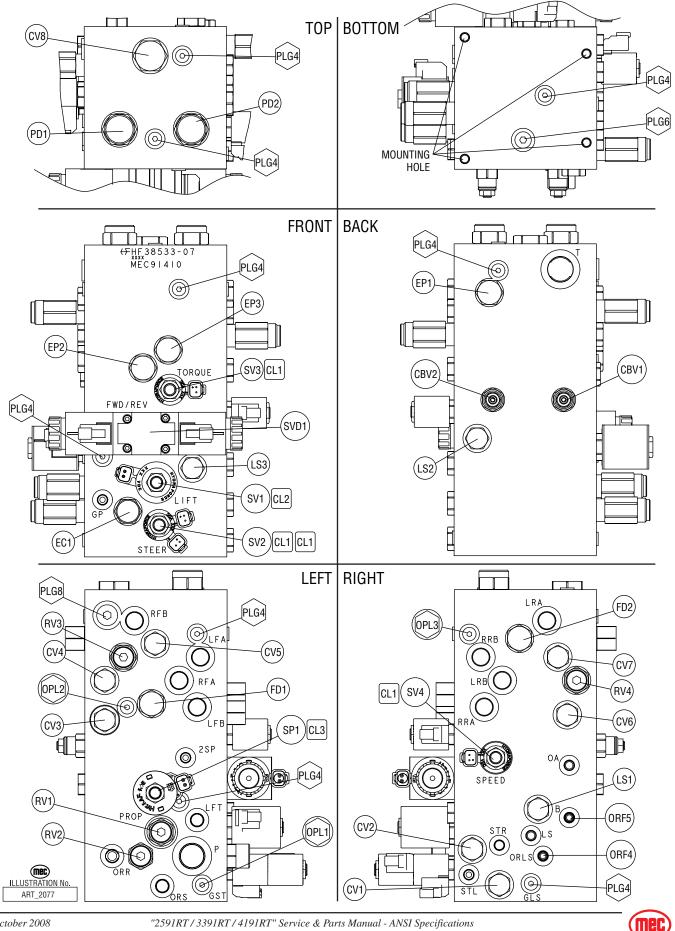






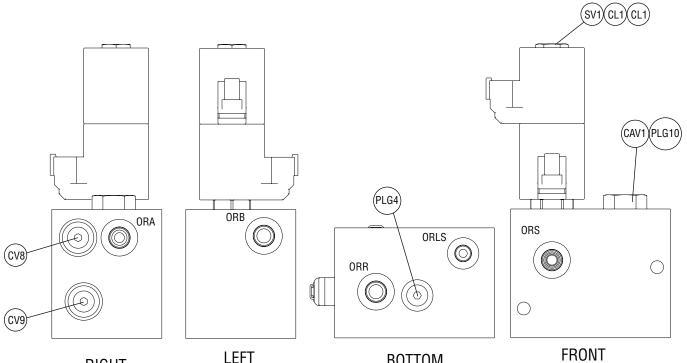
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Main Hydraulic Manifold



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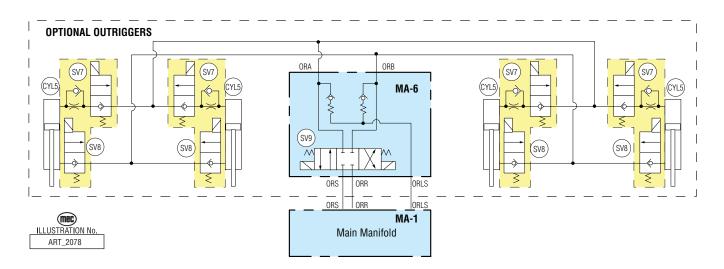
Optional Outriggers



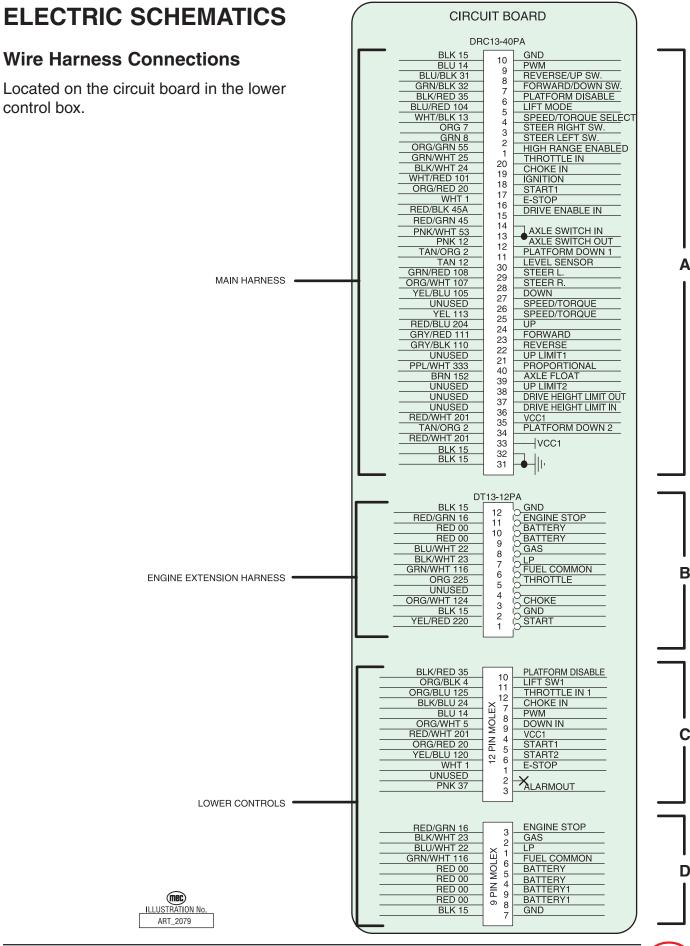
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BOTTOM





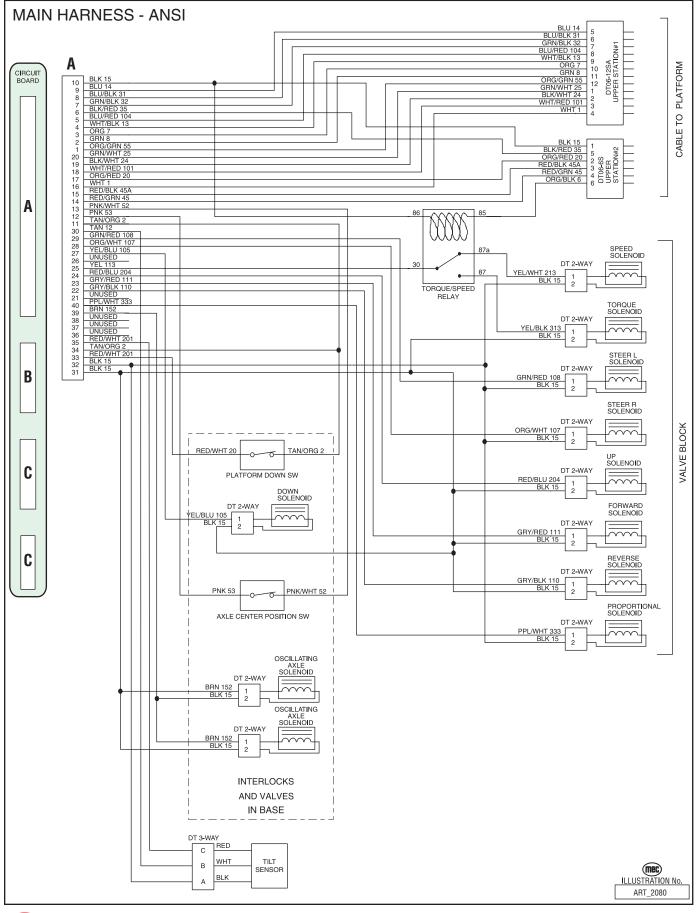


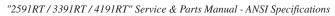
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Main Wiring Harness

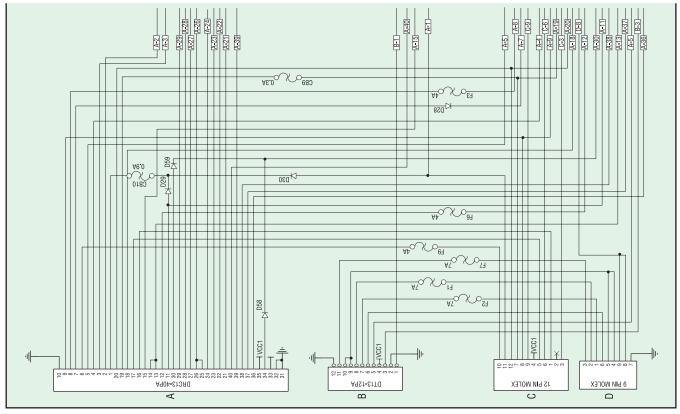
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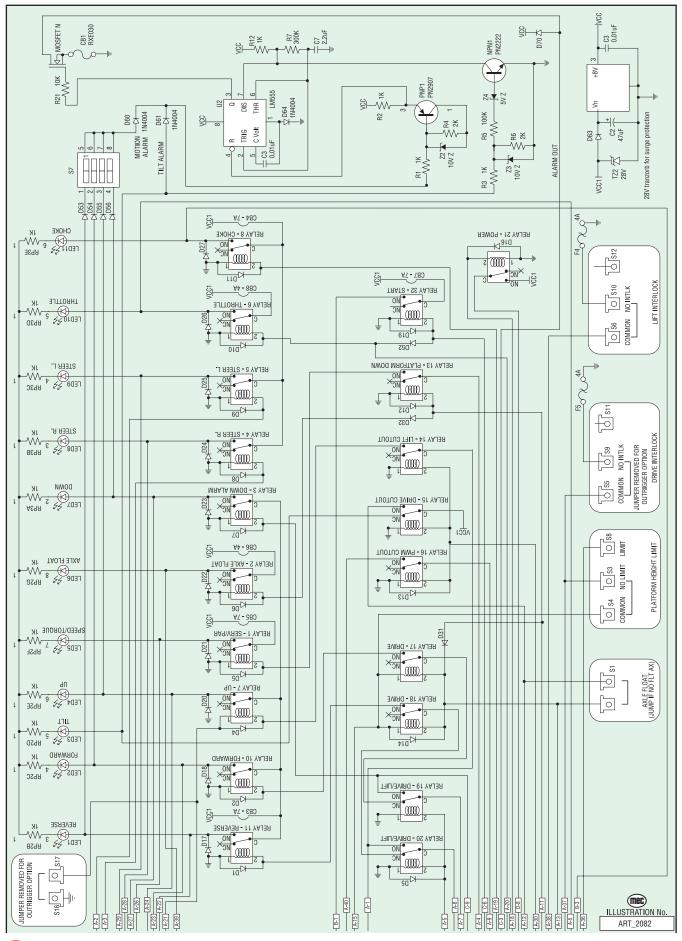
Circuit Board Schematic

The Circuit Bard schematic is broken into two pages for clarity. The cable connections are shown on this page. Match the numbers to line-up the traces.





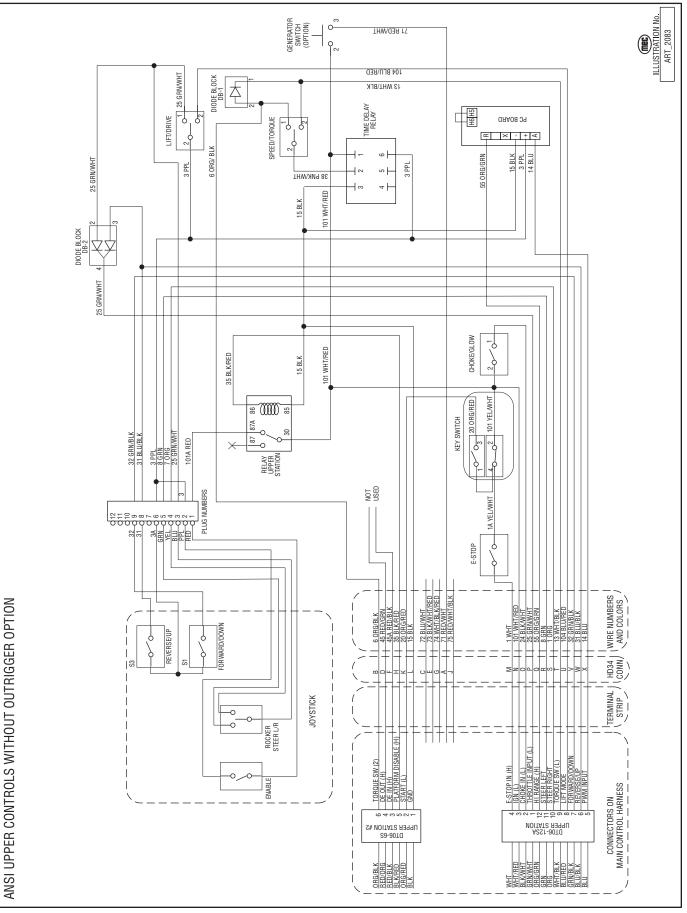






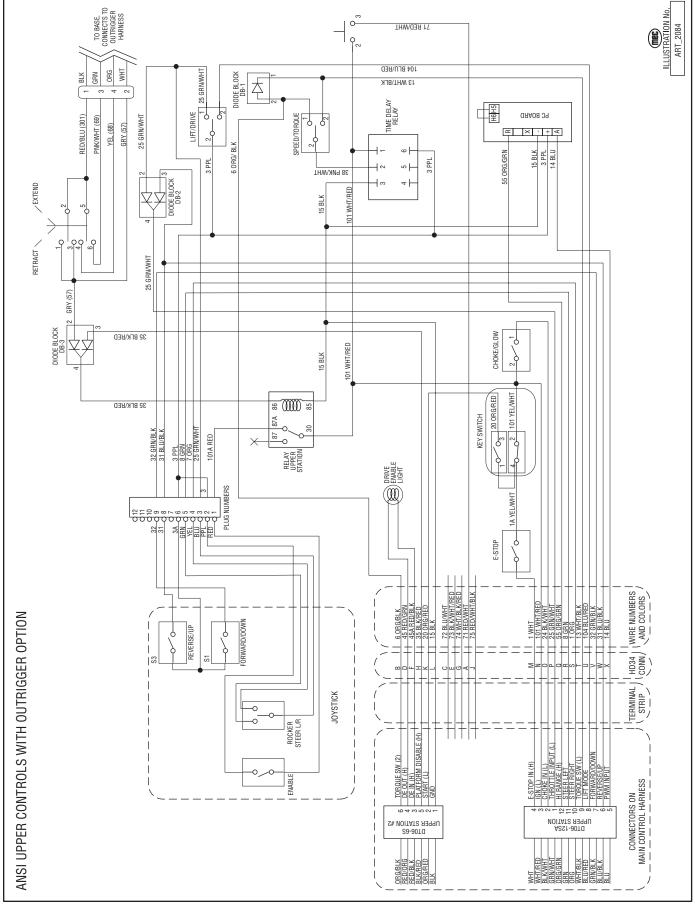
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Upper Controls



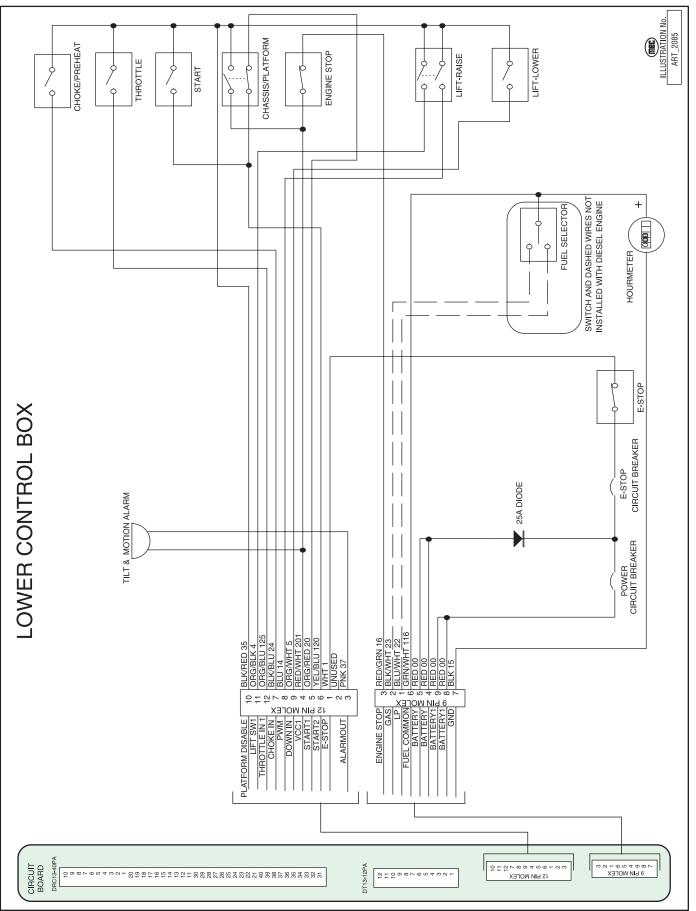


Upper Controls - With Outriggers



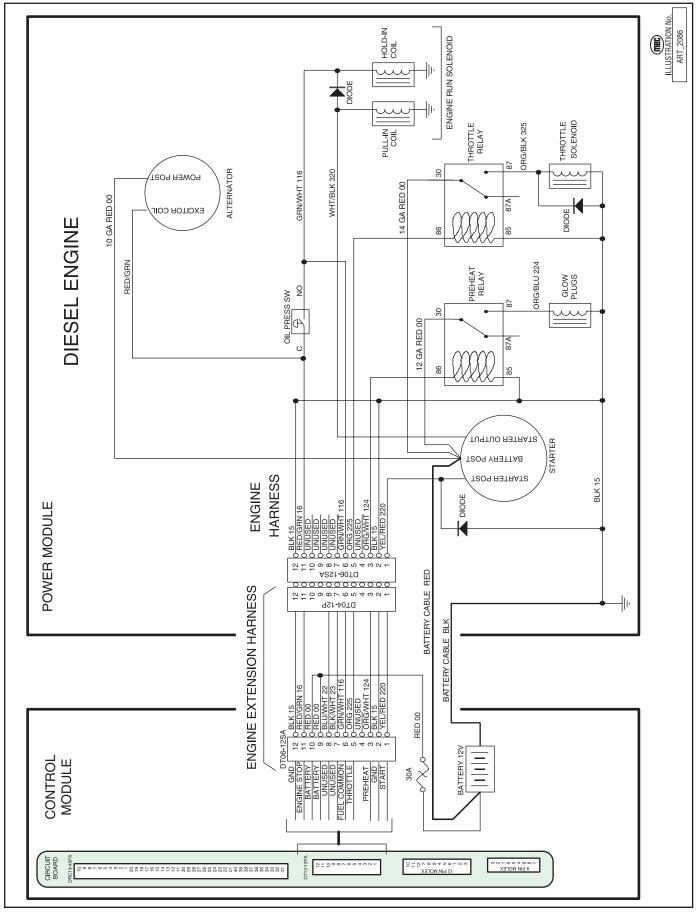


Lower Control Box



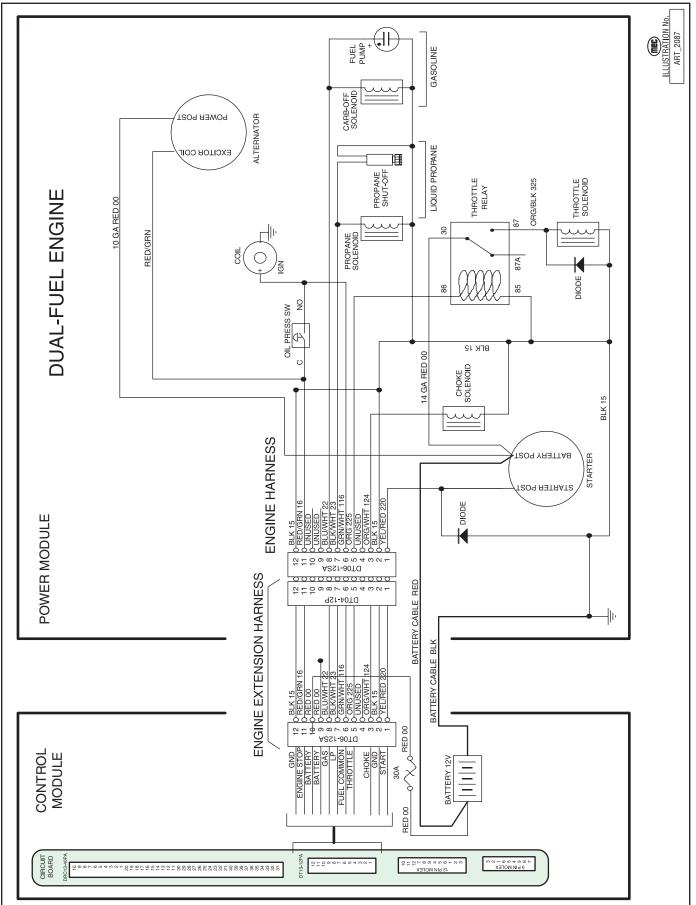


Diesel Engine



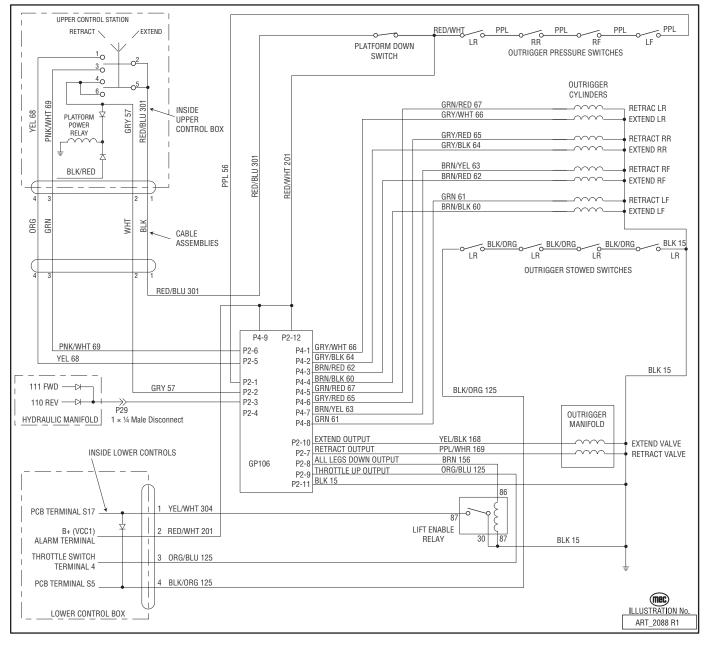


Dual Fuel Engine





Optional Outriggers



Optional Generator

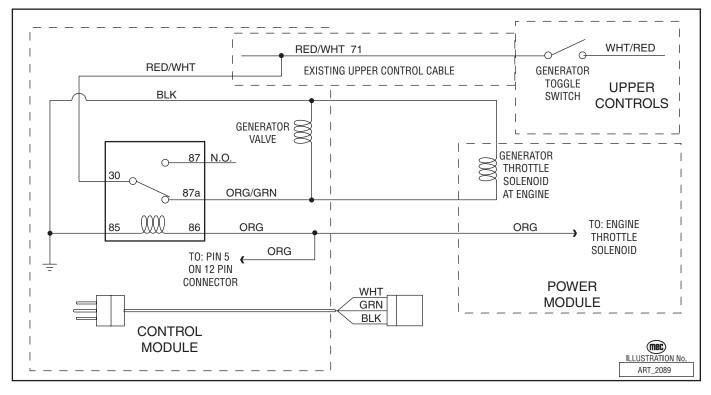




Table of Contents Parts Section

SECTION A: CONTROL BOXES

UPPER CONTROLS, ANSI	A-3
UPPER CONTROL BOX COVER ASSEMBLY	A-5
UPPER CONTROL JOYSTICK	A-7
BASE CONTROL BOX	A-9

SECTION B: PLATFORM AND RAILS

PLATFORM ASSEMBLY	B-3
ROLLOUT LOCK PIN ASSEMBLY	B-5
Roller Assembly	B-7
Entry Chain	B-9
Swing Gate (Option)	B-11
CONTROL CABLE/HORN INSTALLATION	B-13
Power to Platform	B-15
AIRLINE TO PLATFORM (OPTION)	B-15
LANYARD ATTACHMENT (OPTION)	B-17

SECTION C: SCISSORS

84001Beam Assembly, 2591RT	C-3
84002BEAM ASSEMBLY - 3391RT	
84003Beam Assembly - 4191RT	C-7
Cable Routing, Scissors	C-9
LIMIT SWITCH INSTALLATION	C-11

SECTION D: AXLES

REAR AXLE ASSEMBLY	.D-3
FRONT AXLE ASSEMBLY	.D-7
Drive Hub with Brake (Rear)I	D-11
DRIVE HUB (FRONT)	D-13



Table of Contents Parts Section

SECTION E: HYDRAULICS

91410Manifold Assembly	E-3
MANIFOLD ASSEMBLY – HARDWARE	E-5
MANIFOLD - OUTRIGGER (OPTION)	E-7
Hose Kit - Drive	
Hose Kit: Pump and Tank Return	
Hose Kit: Brake & Oscillating Axle	E-11
Hose Kit: Steering	
Hose Kit: Wheel Motor Case Drain	E-13
Hose Kit: Outrigger Option	E-15
Hose KIT - GENERATOR OPTION	E-17
LIFT CYLINDER, 2591RT, 3391RT	E-19
LIFT CYLINDER, LOWER, 4191RT	E-21
LIFT CYLINDER, UPPER, 4191RT	E-23
STEERING CYLINDER	E-25
FLOATING AXLE LOCK CYLINDER	E-27
OUTRIGGER CYLINDER (OPTION)	E-29

SECTION F: BASE

BASE ASSEMBLY	F-3
CONTROL MODULE	F-5
Power Module	F-9
Power Module: Engine Mount - Diesel	F-13
ENGINE, DUAL FUEL	F-17
Engine, Diesel	F-21
WIRE HARNESS	F-25
Outrigger Installation (Option)	F-27
GENERATOR - OPTION	F-29

SECTION G: DECALS

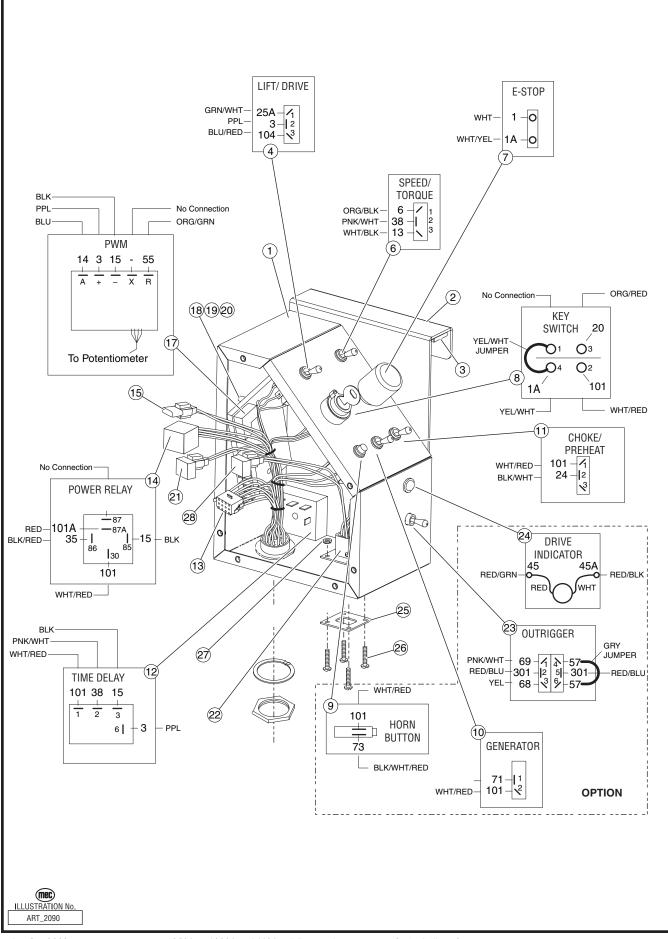
DECAL KIT, CONTROLS	G-3
Decal Kit, Base	
Decal Kit, Scissors	
DECAL KIT, PLATFORM	G-9
DECAL KIT, ANCHORAGE POINTS OPTION	G-11
DECAL KIT, OUTRIGGER OPTION	G-11



SECTION A: CONTROL BOXES

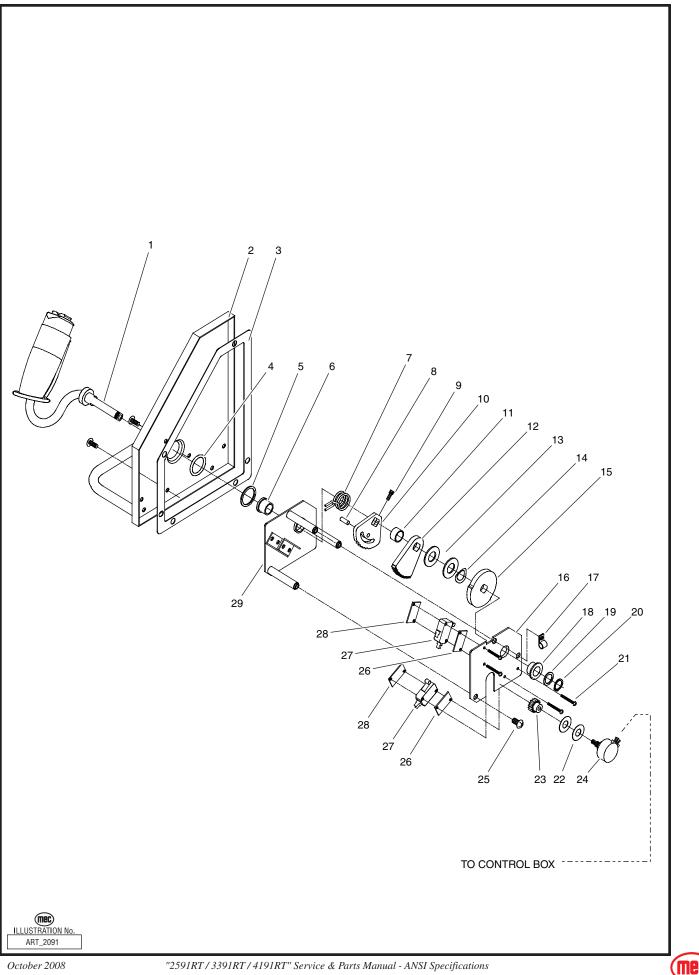
UPPER CONTROLS, ANSI	A-3
UPPER CONTROL BOX COVER ASSEMBLY	A-5
UPPER CONTROL JOYSTICK	A-7
Base Control Box	A-9
"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications	October 2008 Page A-1



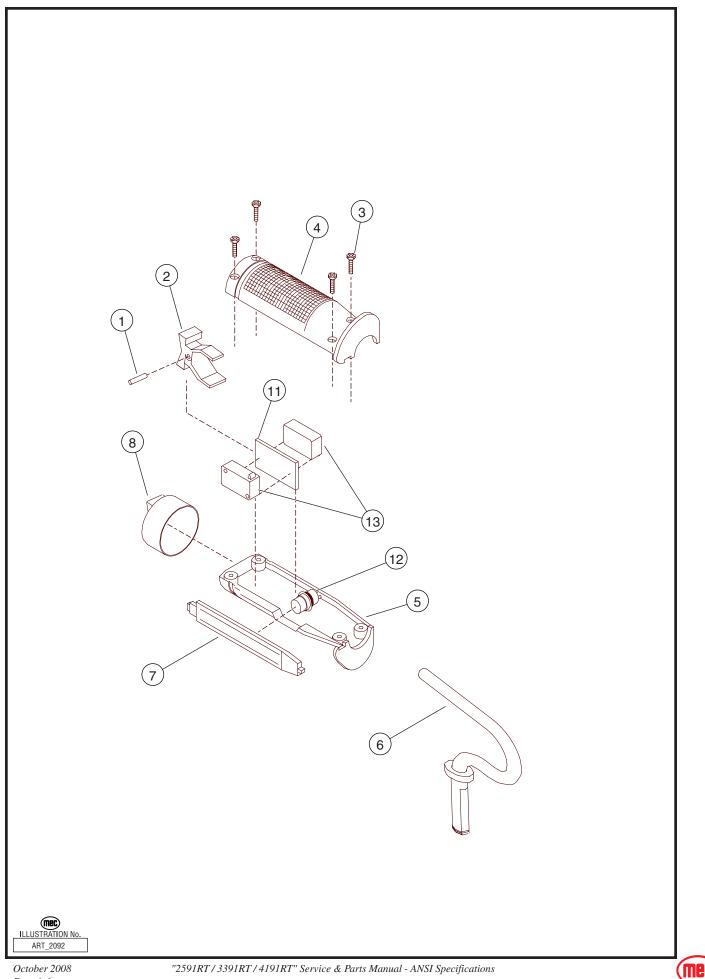




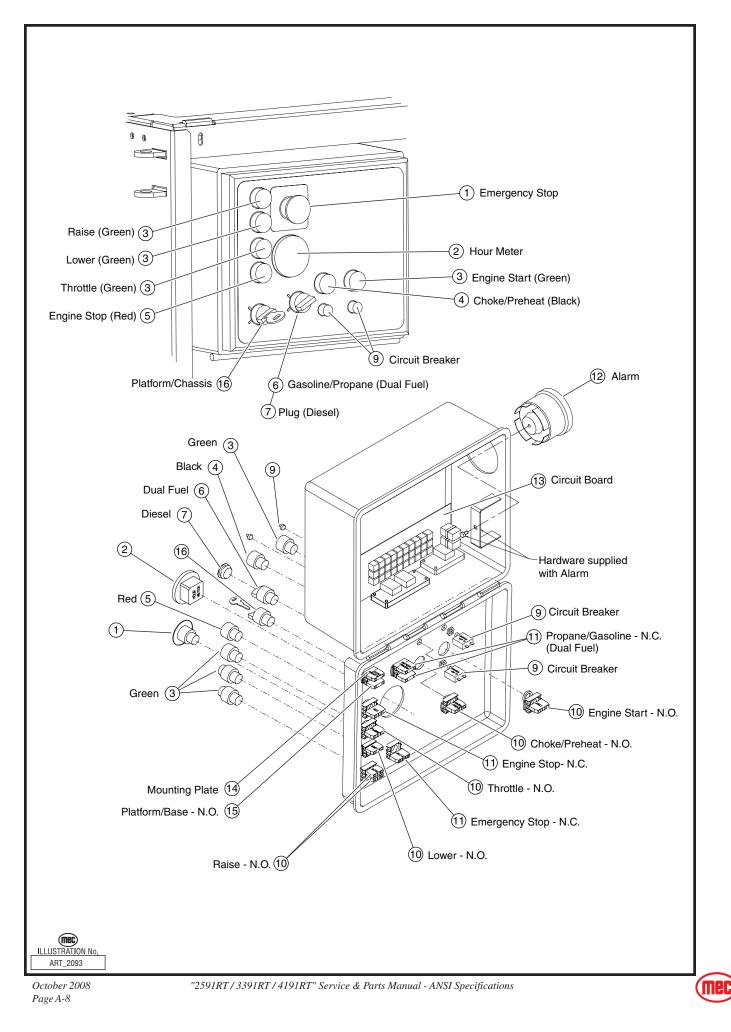
ITEM	PART NO.	QTY	DESCRIPTION
			UPPER CONTROLS, ANSI
	91108	-	CONTROL BOX ASSEMBLY, ANSI
1	16242	1	WELDMENT, CONTROL BOX
2	13865	1	BRACKET, CONTROL BOX HOLDER
3	6350	.5FT	TAPE, FOAM
4	6234	1	SWITCH, TOGGLE, LIFT/DRIVE
6	6905	1	SWITCH, TOGGLE, SPEED/TORQUE
7	7800	1	SWITCH, EMERGENCY STOP
8	91619	1	START SWITCH
9	8044	1	SWITCH, HORN BUTTON (OPTION)
10	5630	1	SWITCH, TOGGLE, GENERATOR (OPTION)
11	7423	1	SWITCH, TOGGLE, CHOKE/PREHEAT
12	91186	1	RELAY, TIME DELAY
13	91184	1	WIRE HARNESS, CONTROL BOX
14	91375	1	RELAY, POWER
15	91027	1	DIODE BLOCK, 2 POSITION
17	91107	1	PWM CARD
18	90814	2	SPACER
19	90833	2	SCREW, 6-32 X 3/4"
20	5364	2	NUT, 6-32
21	91028	1	DIODE BLOCK, 4 POSITION
			OUTRIGGER OPTION
22	91294	1	HARNESS, OUTRIGGER CONTROL
23	5694	1	SWITCH, TOGGLE
24	90789	1	LED, GREEN, DRIVE ENABLED
25	16312	1	PLATE, MOUNTING, OUTRIGGER PLUG
26	90833	2	SCREW, 6-32 X 3/4"
27	5364	2	NUT, 6-32
28	91028	1	DIODE BLOCK, 4 POSITION



ITEM	PART NO.	QTY	DESCRIPTION
			UPPER CONTROL BOX COVER ASSEMBLY
			CONTROL BOX COVER ASSEMBLY
1	13647	1	CONTROL ARM COVER
2	3772	1	COVER
3	7875	1	GASKET
4	7882	1	O-RING, 7/8" ID X 1 1/8" OD
5	HDW3768	1	WASHER, FLAT
6	7819	1	BEARING, BRONZE, FLANGED
7	8435	1	SPRING, JOYSTICK, CENTERING
8	100/8348	1	PIN, HOLD DOWN
9	HDW7887	1	SCREW, #6-32, 1/2" LG
10	13502	1	BRACKET, CENTERING
11	3763	1	SPACER, STEP
12	13402	1	GEAR, LARGE
13	HDW8531	2	WASHER, FLAT
14	HDW7881	1	WASHER, BEVEL
15	3782	1	CAM. DIRECTIONAL
16	13403	1	PLATE, BOTTOM
17	6917	1	CLAMP, CABLE 1/4"
18	7818	1	BEARING, BRONZE, FLANGED
19	HDW3771	1	WASHER, FLAT
20	5736	1	RING, RETAINING, 1/2"
21	HDW8399	4	SCREW, #4 - 40, 5/8" LG
22	HDW8567	2	WASHER, FLAT
23	8389	1	GEAR, SPUR
24	91522	1	POTENTIOMETER
25	HDW7888	12	SCREW, #10 - 32, 1/2" LG
26	3764	2	PLATE, SPACER
27	8696	2	SWITCH, LIMIT, MICRO V7
28	3765	2	PLATE, STRAP
29	3766	1	PLATE, TOP



ITEM	PART NO.	QTY	DESCRIPTION
			UPPER CONTROL JOYSTICK
	13647		CONTROL ARM ASSEMBLY, JOYSTICK
1	8750	1	PIN (SERVICE ONLY)
2	8453	1	SWITCH ACTUATOR (SERVICE ONLY)
3	HDW8455	4	SCREW, 6-1/2" LG (SERVICE ONLY)
4	8752	1	GRIP-TOP HALF (SERVICE ONLY)
5	8751	1	GRIP-BOTTOM HALF (SERVICE ONLY)
6	13638	1	CONTROL ARM WITHOUT WIRE
7	8748	1	TRIGGER (SERVICE ONLY)
8	8456	1	ROCKER BOOT (SERVICE ONLY)
	7476	5	AMP PINS
	8630	1	HANDLE, GRIP
	8761		SWITCH ASSEMBLY (NOT SHOWN)
	8089	1'	WIRE, BLK 18GA 300 V
	7777	2	TERMINAL, PUSH ON, 3/16"
11	8447	1	SWITCH SEPARATOR (SERVICE ONLY)
12	8753	1	MOTION SWITCH, ON-OFF (SERVICE ONLY)
13	8448	2	SWITCH (SERVICE ONLY)
<u> </u>			
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ITEM	PART NO.	QTY	DESCRIPTION
			BASE CONTROL BOX
	91169	-	BASE CONTROL PANEL - COMPONENTS
1	7800	1	SWITCH, EMERGENCY STOP
2	7909	1	HOUR METER
3	91533	4	SWITCH, BUTTON, GREEN
4	91534	1	SWITCH, BUTTON, BLACK
5	91535	1	SWITCH, BUTTON, RED
6	91536	1	SWITCH, 2-POSITION
7	91329	1	PLUG (DIESEL)
8	91536	1	SWITCH, 2-POSITION (DUAL FUEL)
9	7235	2	CIRCUIT BREAKER, 15 AMP
10	91537	6	BLOCK, CONTACT, N.0. (DIESEL)
	91537	8	BLOCK, CONTACT, N.0. (DUAL FUEL)
11	91538	4	BLOCK, CONTACT, N.C.
12	91539	1	ALARM, 107DB
13	91370	1	CIRCUIT BOARD
14	90714	1	BASE, CONTACT MOUNT
15	8082	2	BLOCK, CONTACT, N.O.
16	9549	1	SWITCH, 3-POSITION, KEYED
17	91698	1	DIODE, 25 AMP (NOT SHOWN)

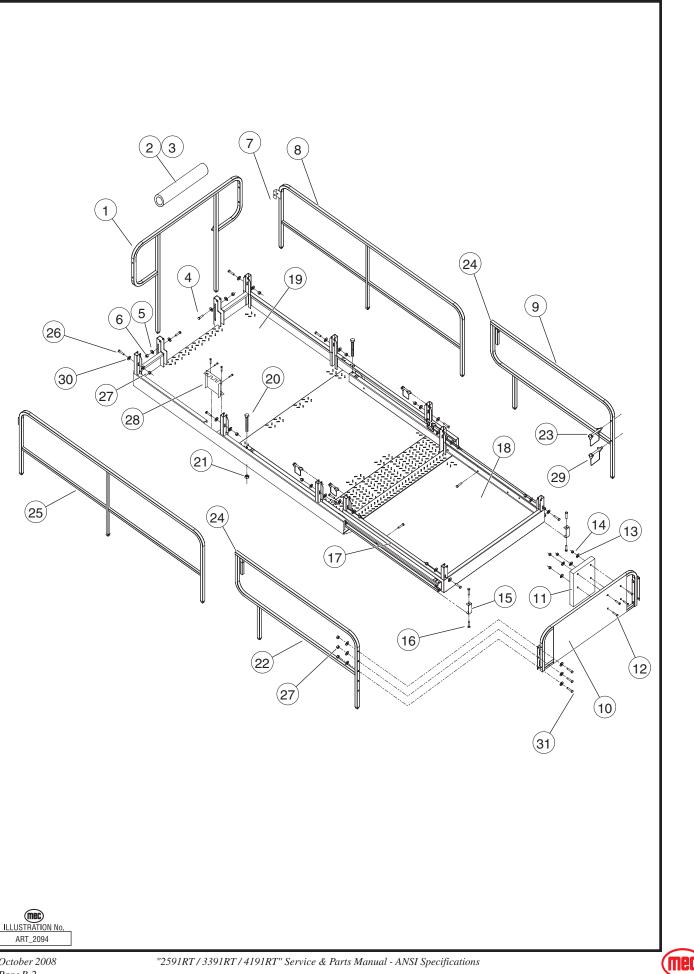
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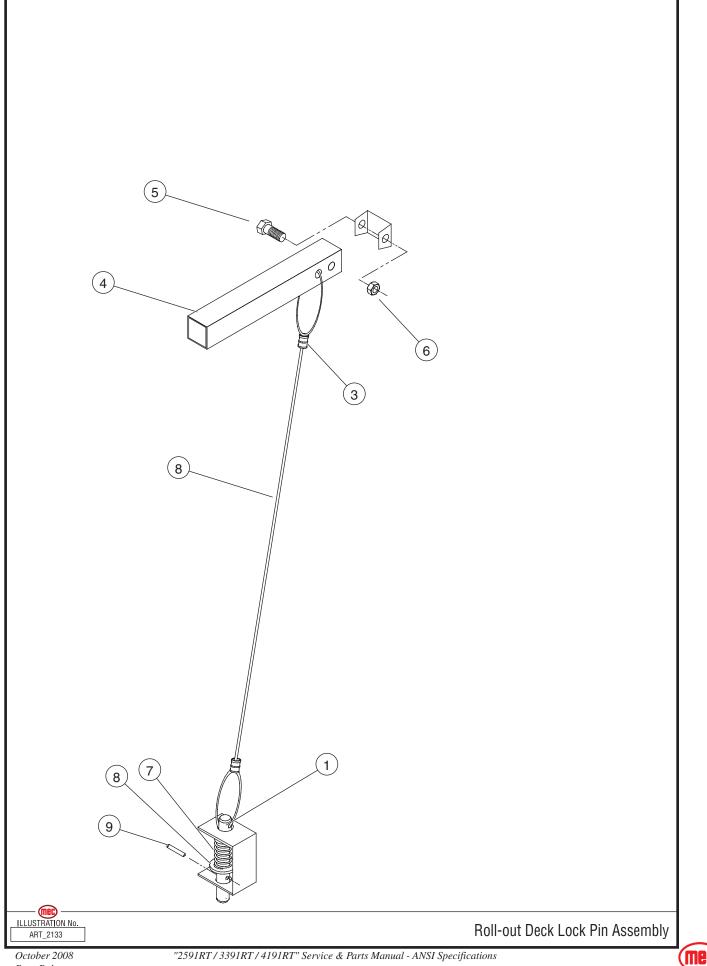
SECTION B: PLATFORM AND RAILS

PLATFORM ASSEMBLY	B-3
ROLLOUT LOCK PIN ASSEMBLY	
ROLLER ASSEMBLY	B-7
Entry Chain	B-9
SWING GATE (OPTION)	B-11
CONTROL CABLE/HORN INSTALLATION	B-13
Power to Platform	B-15
AIRLINE TO PLATFORM (OPTION)	B-15
LANYARD ATTACHMENT (OPTION)	B-17



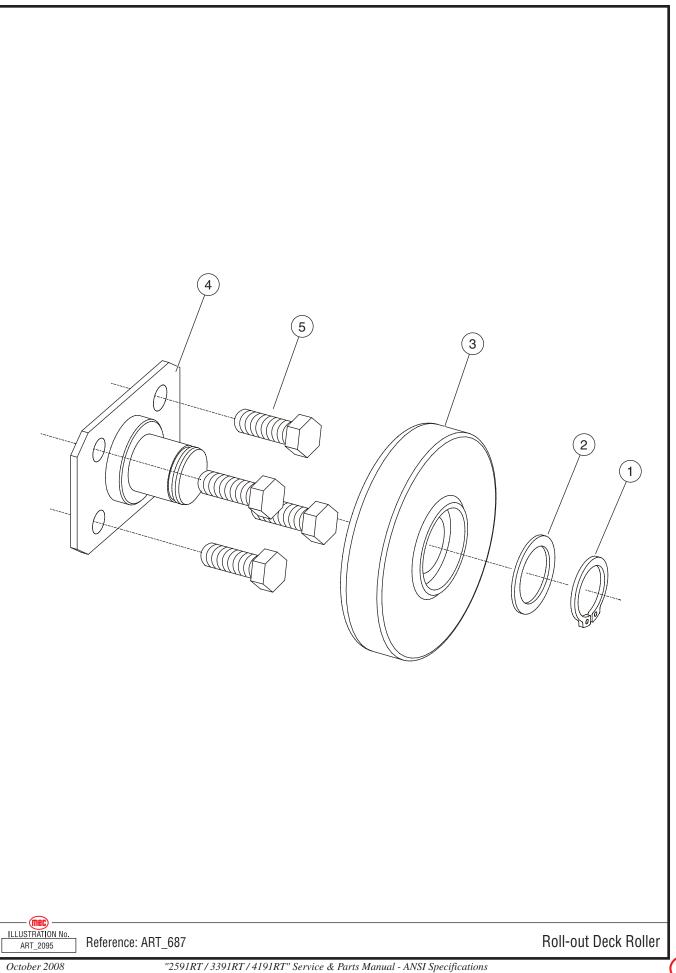


ITEM	PART NO.	QTY	DESCRIPTION
			PLATFORM ASSEMBLY
1	16436	1	REAR RAIL WELDMENT
2	7805	1	PADDING, RAIL (OPTIONAL)
3	7048	1	COVER, RAIL PADDING (OPTIONAL)
4	HDW7119	2	SCREW, 5/16" - 18, 2 ¼" LG, GR 5
5	HDW5217	4	FLAT WASHER, .343 ID \times .688 OD \times .063 THK
6	HDW8304	6	NUT, 5/16" - 18
7	HDW7593	6	PIN, WIRE LOCK, SQUARE, 3/8" × 2 ¼" LG
8	16433	1	SIDE RAIL WELDMENT, LH
9	14301	1	SIDE RAIL WELDMENT - EXTENSION
10	16435	1	FRONT RAIL WELDMENT
11	8909	1	MANUAL ENCLOSURE
12	HDW5723	8	SCREW, ¼" - 20, ½" LG
13	HDW8294	4	FLAT WASHER, .328 ID × 1.000 OD × .100 THK
14	HDW8267	4	NUT, ¼" - 20
15	14415	2	BRACKET, EXTENSION STOP
16	HDW5724	20	SCREW, 5/16" - 18, ¾" LG, GR 5
17	14152	2	CHANNEL, EXTENSION
18	16429	1	EXTENSION PLATFORM WELDMENT
19	16437	1	MAIN PLATFORM WELDMENT
20	HDW8856	2	SCREW, ½"-13, 5" LG
21	HDW8457	2	NUT, ½" - 13
22	14313	1	RIGHT SIDE RAIL WELDMENT - EXTENSION
23	HDW8974	1	PIN, WIRE LOCK, SQUARE, $3/8^{\circ} \times 3^{\circ}$ LG
24	6823	2	CAP PLUG, 1 ¼"
25	16434	1	SIDE RAIL WELDMENT, RH
26	HDW8279	10	SCREW, 3/8-16, 2½" LG
27	HDW8268	10	NUT, 3/8-16
28	20552	1	COVER, PLATFORM CORD
29	91284	1	PIN HITCH 3/8" × 4
30	HDW5355	20	WASHER, FLAT, .438 ID×1.00 OD×.078 THK
31	HDW6434	3	SCREW, 3/8-16×2" LG



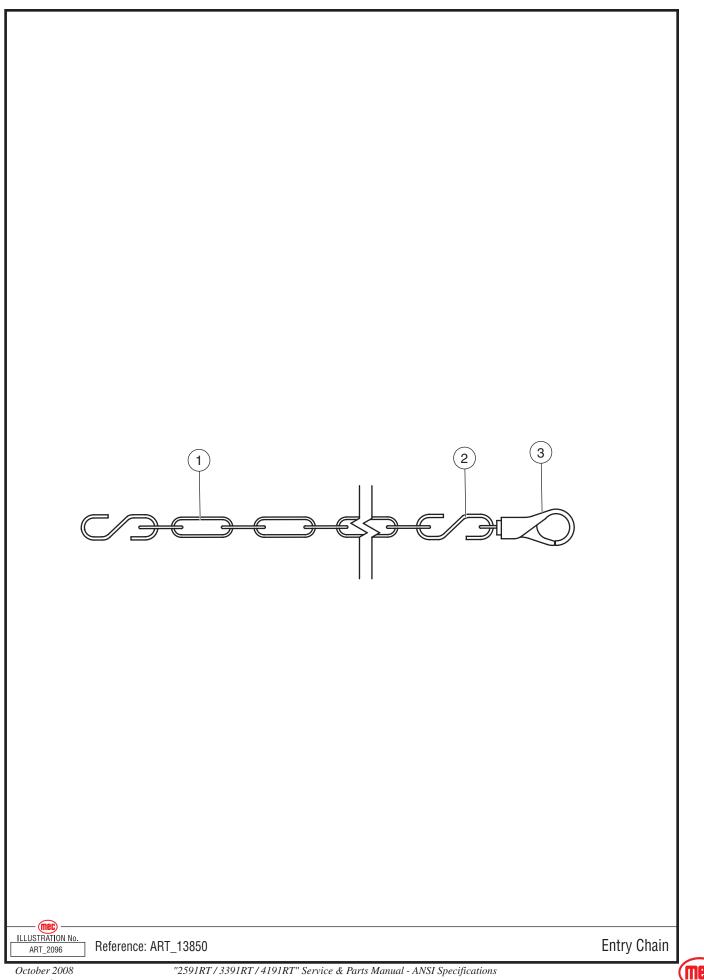


ITEM	PART NO.	QTY	DESCRIPTION
			ROLLOUT LOCK PIN ASSEMBLY
1	13737	1	PIN, EXTENSION LOCK
2	7184	3.7 FT	CABLE, COATED AND ROLLED
3	8814	2	SLEEVE, ALUMINUM OVAL
4	20235	1	HANDLE
5	HDW8303	1	SCREW, 5/16" - 18, 2" LG
6	HDW8304	1	LOCKNUT, 5/16" - 18
7	7408	1	SPRING, DECK LOCK
8	HDW7031	1	WASHER, FLAT, ½" ID 7/8" OD
9	HDW8513	1	PIN, SPRING, 1/8" DIA. ¾" LG

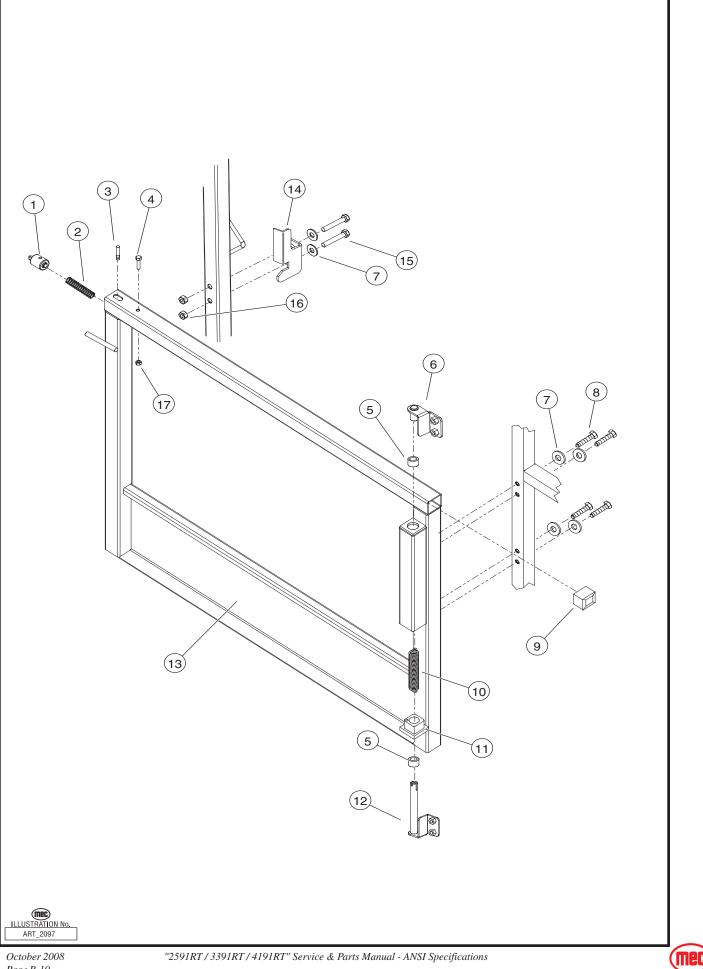




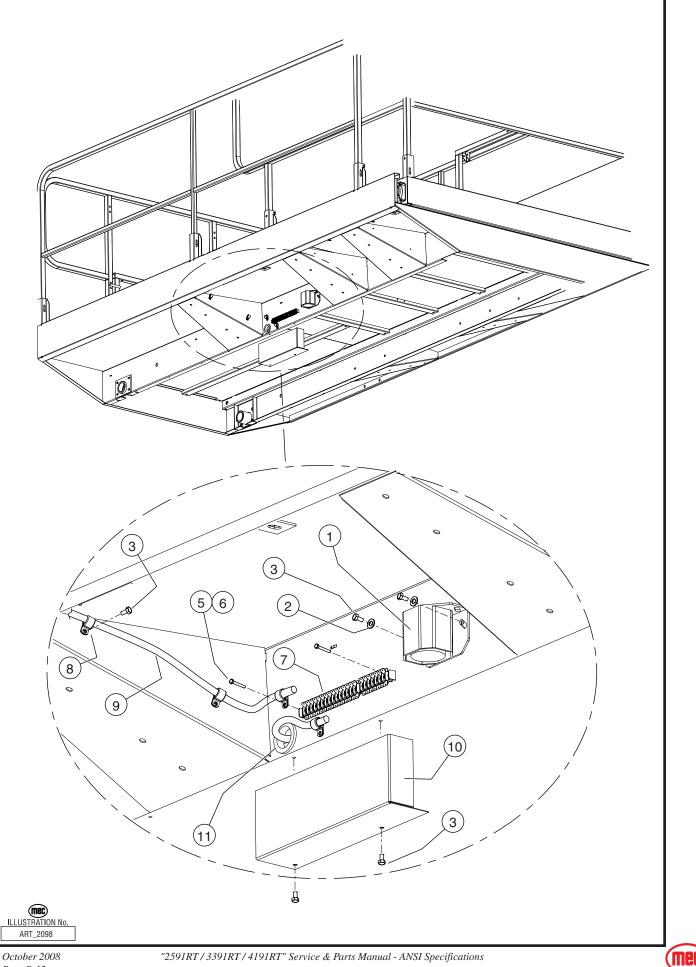
ITEM	PART NO.	QTY	DESCRIPTION
			ROLLER ASSEMBLY
1	5918	1	RETAINING RING, HEAVY DUTY 1"
2	HDW8370	1	WASHER, FLAT, 1.015 ID \times 1.375 OD \times .062 THK
3	13230	1	ROLLER
4	14062	1	ROLLER PLATE WELDMENT
5	HDW5724	4	SCREW, 5/16" - 18, ¾" LG



ITEM	PART NO.	QTY	DESCRIPTION
			CHAIN CLOSURE
1	13846	1	CHAIN
2	5239	2	S-HOOK, CONNECTING LINK
3	8781	1	SNAP, CHAIN LINK
<u> </u>			
<u> </u>			
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ITEM	PART NO.	QTY	DESCRIPTION
			SWING GATE (OPTION)
1	40003	1	LATCH PIN, REAR GATE
2	7055	1	SPRING, LATCH, .480 DIA. OD \times 1.5" LG
3	40006	1	ROD, LATCH LEVER, REAR GATE
4	HDW6434	1	SCREW, 3/8-16 × 2" LG
5	8187	2	BEARING, NYLINER, 5/8" ID × 5/8" LG
6	40014	1	MOUNTING BRACKET, UPPER
7	HDW8294	6	WASHER, .328" ID \times 1" OD \times .100" THK
8	HDW8486	4	SCREW, 5/16" - 18, 1 7/8" LG, GR 5
9	6823	1	CAP PLUG, 1 ¼" SQUARE
10	8300	1	SPRING, TORSION, 1" DIA. OD × 4" LG
11	13272	1	BLOCK, PIVOT, REAR GATE
12	40015	1	MOUNTING BRACKET, LOWER
13	40017	1	SWING GATE WELDMENT
14	30814	1	STRIKE PLATE
15	HDW8303	2	SCREW, 5/6"-18, 2" LG, GR 5
16	HDW7120	2	NUT, 5/16"-18, GR 5
17	HDW8268	1	NUT, 3/8-16





"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

ITEM	PART NO.	QTY	DESCRIPTION
			CONTROL CABLE/HORN INSTALLATION
1	9716	1	HORN, 12-48V (OPTION)
2	HDW5217	2	WASHER, FLAT, .343 ID \times .688 OD \times .063 THK
3	HDW6455	5	SCREW, ¼"-20, ½" LG, GR 5
5	HDW5363	3	SCREW, #6-32, 1" LG, GR 5
6	HDW5364	3	NUT, KEPS, #6-32 , GR 5
7	6947	1	TERMINAL STRIP
8	6964	4	CLAMP, CABLE, 1" DIA.
9		REF	CABLE, UPPER CONTROL
10	16485	1	COVER, TERMINAL STRIP
11	5863	1	GROMMET, 1.5 ID \times 1.75 OD \times .187 THK

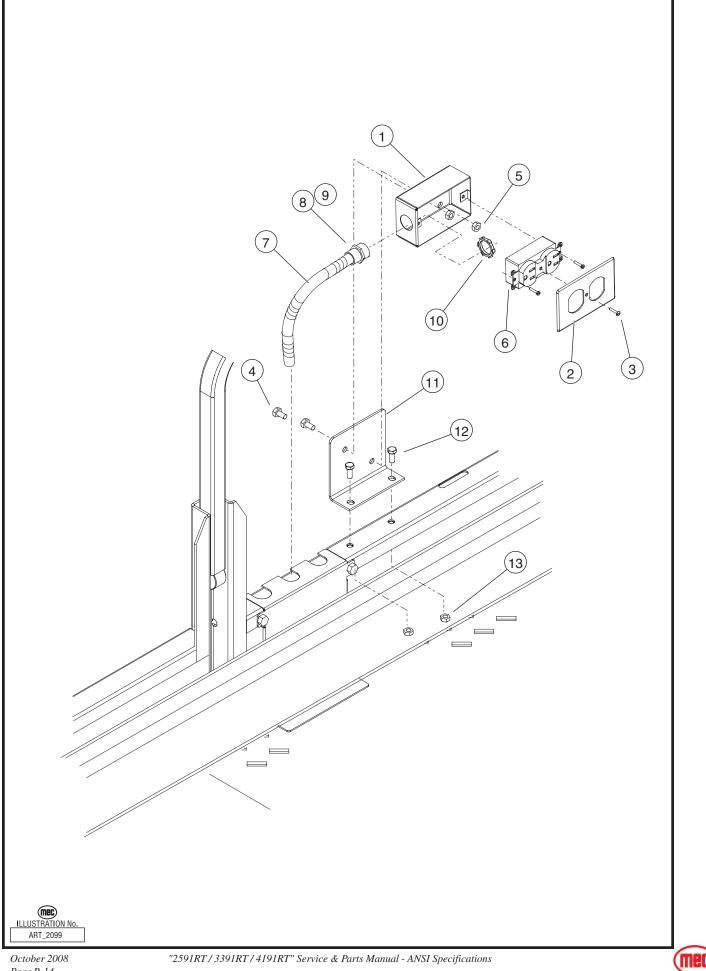
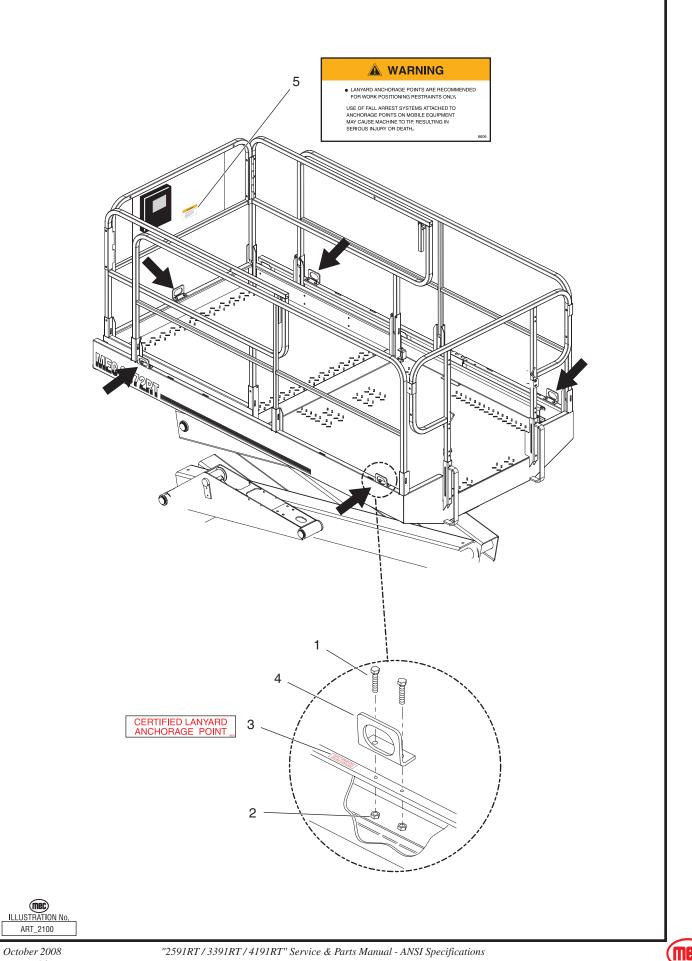


Image: Power to PLATFORM 1 90827 1 BOX, RECEPTACLE 2 90828 1 DUPLEX RECEPTACLE COVER 3 HDW5636 1 SCREW #6 - 32 × 0.25" 4 HDW6455 2 SCREW, ½" - 20, ½" LG 5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, 3/4" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16-18 × 3/4" 13 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA * *2591RT = 50 FT. *3391RT = 58 FT. * *4191RT = 68 FT. *4191RT 6351 1 CABLE TIE 91399 * HOSE, 3/8" A	ITEM	PART NO.	QTY	DESCRIPTION
2 90828 1 DUPLEX RECEPTACLE COVER 3 HDW5636 1 SCREW #6 - 32 × 0.25" 4 HDW6455 2 SCREW, ¼" - 20, ½" LG 5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. *4191RT = 68 FT. AIRLINE TO PLATFORM (OPTION) NOT SHOWN NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT.				Power to Platform
2 90828 1 DUPLEX RECEPTACLE COVER 3 HDW5636 1 SCREW #6 - 32 × 0.25" 4 HDW6455 2 SCREW, ¼" - 20, ½" LG 5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. *4191RT = 68 FT. AIRLINE TO PLATFORM (OPTION) NOT SHOWN NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT.				
3 HDW5636 1 SCREW #6 - 32 × 0.25" 4 HDW6455 2 SCREW, ¼" - 20, ½" LG 5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 411 * 2591RT = 50 FT. * 3391RT = 58 FT. 4191RT = 68 FT. * 4191RT = 68 FT. 4191RT = 68 FT. * 4191RT = 68 FT. 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE * 2591RT = 49 FT. * 3391RT = 57 FT. 8559 2 CLAMP, HOSE 9 2 CLAMP, HOSE 9	1	90827	1	BOX, RECEPTACLE
4 HDW6455 2 SCREW, ¼" - 20, ½" LG 5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 41 * WIRE, 14 GA 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *3391RT = 57 FT. *3391RT = 67 FT. *4191RT = 67 FT. *3391RT = 67 FT. <t< td=""><td>2</td><td>90828</td><td>1</td><td>DUPLEX RECEPTACLE COVER</td></t<>	2	90828	1	DUPLEX RECEPTACLE COVER
5 HDW8267 2 LOCKNUT ¼" - 20 6 5381 1 RECEPTACLE, DUPLEX 7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. *3391RT = 57 FT. *4191RT = 67 FT. *4191RT = 67 FT.	3	HDW5636	1	SCREW #6 - 32 × 0.25"
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7 8208 1 CONDUIT, 3/8" FLEXIBLE 8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, 3/4" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × 3/4" 13 HDW8304 2 NUT, 5/16–18 41 * WIRE, 14 GA 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	5	HDW8267	2	LOCKNUT ¼" - 20
8 8209 1 FERRULE, 3/8" 9 8479 1 BUSHING, 34" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × 34" 13 HDW8304 2 NUT, 5/16–18 4 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA 4 *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. 4 HDW5217 2 FLAT WASHER 11/32" ID 4 HDW5217 2 FLAT WASHER 11/32" ID 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE 2591RT = 49 FT. * 3391RT = 57 FT. 4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼	6	5381	1	RECEPTACLE, DUPLEX
9 8479 1 BUSHING, ¾" ID 10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA * 2591RT = 50 FT. *3391RT = 58 FT. * HDW5217 2 FLAT WASHER 11/32" ID HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 57 FT. *3391RT = 57 FT. *3391RT = 57 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	7	8208	1	CONDUIT, 3/8" FLEXIBLE
10 8833 1 CONNECTOR, OUTLET BOX 3/8" CONDUIT 11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA 11 *2591RT = 50 FT. *3391RT = 58 FT. 11 *4191RT = 68 FT. 11 HDW5217 12 FLAT WASHER 11/32" ID 13 HDW5217 14 CABLE TIE 91399 * HOSE, 3/8" AIRLINE 15 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *3391RT = 57 FT. *4191RT = 67 FT.	8	8209	1	FERRULE, 3/8"
11 16221 1 BRACKET 12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. * 3391RT = 57 FT. *3391RT = 57 FT. * 4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	9	8479	1	BUSHING, 34" ID
12 HDW5724 2 SCREW, 5/16–18 × ¾" 13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	10	8833	1	CONNECTOR, OUTLET BOX 3/8" CONDUIT
13 HDW8304 2 NUT, 5/16–18 HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	11	16221	1	BRACKET
HDW8501 2 CLIP, SELF RETAINING 9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB	12	HDW5724	2	SCREW, 5/16–18 × ¾"
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9441 * WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				
9441 WIRE, 14 GA *2591RT = 50 FT. *3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB		HDW8501	2	CLIP, SELF RETAINING
*3391RT = 58 FT. *4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. 8559 2 HDW91500 2 FITTING, 1/4" MALE, MALE HOSE BARB		9441	*	WIRE, 14 GA
*4191RT = 68 FT. HDW5217 2 FLAT WASHER 11/32" ID AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. 8559 2 HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				*2591RT = 50 FT.
HDW5217 2 FLAT WASHER 11/32" ID HDW521500 2 FITTING, ¼" MALE, MALE HOSE BARB				*3391RT = 58 FT.
AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. 8559 2 HDW91500 2 FITTING, 1/4" MALE, MALE HOSE BARB				*4191RT = 68 FT.
AIRLINE TO PLATFORM (OPTION) NOT SHOWN 5351 1 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *3391RT = 57 FT. *4191RT = 67 FT. 8559 2 HDW91500 2 FITTING, 1/4" MALE, MALE HOSE BARB				
NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *2591RT = 57 FT. *3391RT = 57 FT. *3391RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB		HDW5217	2	FLAT WASHER 11/32" ID
NOT SHOWN 5351 1 CABLE TIE 91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *2591RT = 57 FT. *3391RT = 57 FT. *3391RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				
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91399 * HOSE, 3/8" AIRLINE *2591RT = 49 FT. *2591RT = 57 FT. *3391RT = 57 FT. *3391RT = 67 FT. *4191RT = 67 FT. *4191RT = 67 FT. 8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				NOT SHOWN
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* 3391RT = 57 FT. *4191RT = 67 FT. 8559 2 HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB		91399	*	
*4191RT = 67 FT. 8559 2 HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				
8559 2 CLAMP, HOSE HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				* 3391RT = 57 FT.
HDW91500 2 FITTING, ¼" MALE, MALE HOSE BARB				*4191RT = 67 FT.
		8559	2	CLAMP, HOSE
5882 2 CABLE CLAMP		HDW91500	2	FITTING, ¼" MALE, MALE HOSE BARB
		5882	2	CABLE CLAMP



Page B-16

ITEM	PART NO.	QTY	DESCRIPTION
			LANYARD ATTACHMENT (OPTION)
	14583	-	LANYARD ATTACHMENT
1	HDW6433	10	SCREW, 3/8" - 16, 1" LG, GR 5
2	HDW8268	10	NUT, 3/8" - 16, GR 5
3	8605	5	DECAL, LANYARD ATTACH POINT
4	3923	5	BRACKET, ATTACH POINT
5	8606	1	DECAL, WARNING, POS RESTRAINTS
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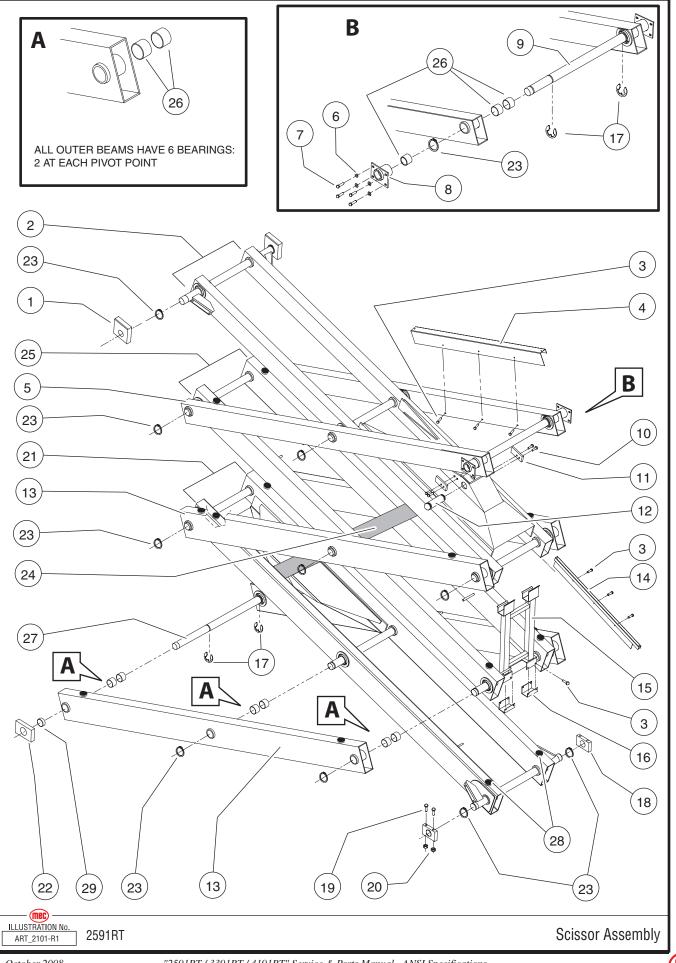




BEAM ASSEMBLY, 2591RT	C-3
BEAM ASSEMBLY - 3391RT	C-5
BEAM ASSEMBLY - 4191RT	C-7
CABLE ROUTING, SCISSORS	C-9
LIMIT SWITCH INSTALLATION	C-11



"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

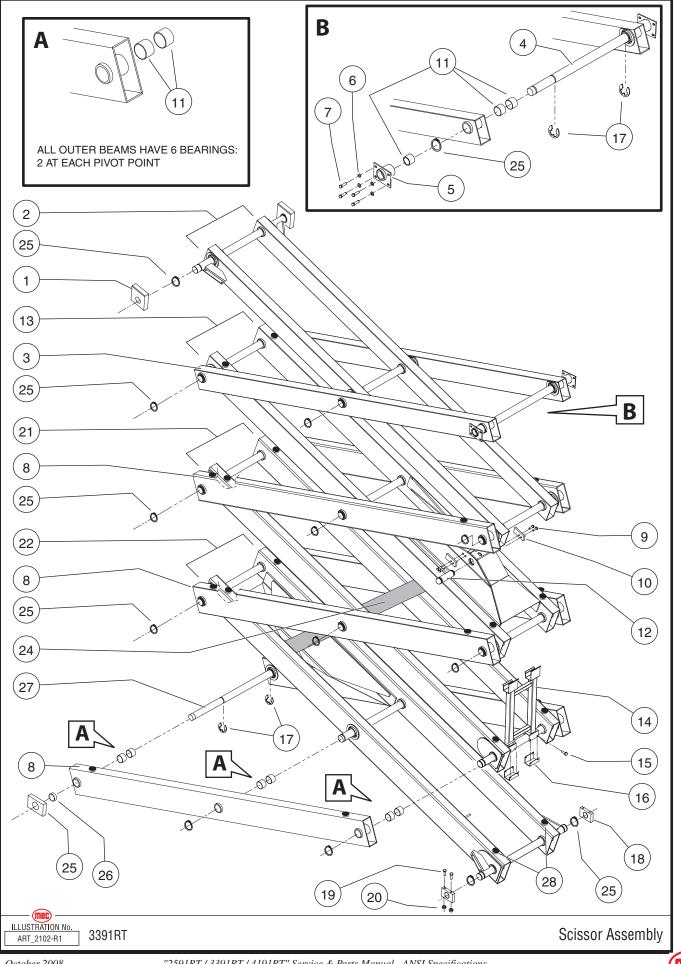




"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications

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ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY, 2591RT
1	20141	2	BLOCK, SLIDE - PLATFORM
2	16468	1	BEAM, SINGLE CYLINDER MOUNT
3	HDW6455	14	SCREW, 1/4" - 20,1/2" LG
4	20913	1	GUARD, CONTROL CORD, SHORT
5	20948	2	BEAM WELDMENT, 3 X 6
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG
8	20365	2	SCISSORS MOUNT ASSEMBLY
9	8340	1	PIN, ROLLER - PLATFORM
10	HDW5724	8	SCREW, 5/16"–18, 3/4" LG
11	20223	4	PLATE, CYLINDER PIN LOCK
12	20224	2	PIN, CYLINDER
13	20932	4	BEAM, OUTER, 3 X 8
14	20839	1	GUARD, CONTROL CORD
15	20778	1	LOCK, MAINTENANCE
16	21133	2	BRACKET, MAINTENANCE LOCK
17	6688	4	CLIP RING, 2" SHAFT
18	20429	2	BLOCK, FIXED - BASE
19	HDW8856	4	SCREW, 1/2" -13, 5" LG
20	HDW6463	4	NUT, 1/2" - 13, NYLON
21	16460	1	BEAM, SINGLE CYLINDER MOUNT
22	20142	2	BLOCK, SLIDE - BASE
23	6701	18	RING, RETAINING, 2" SHAFT
24	91403	1	CYLINDER, LIFT
25	20937	1	BEAM, INNER, CENTER
26	6669	38	BEARING
27	20413	1	PIN-SLIDE, BASE
28	25429	16	SPACER BLOCK
29	6670	2	BEARING
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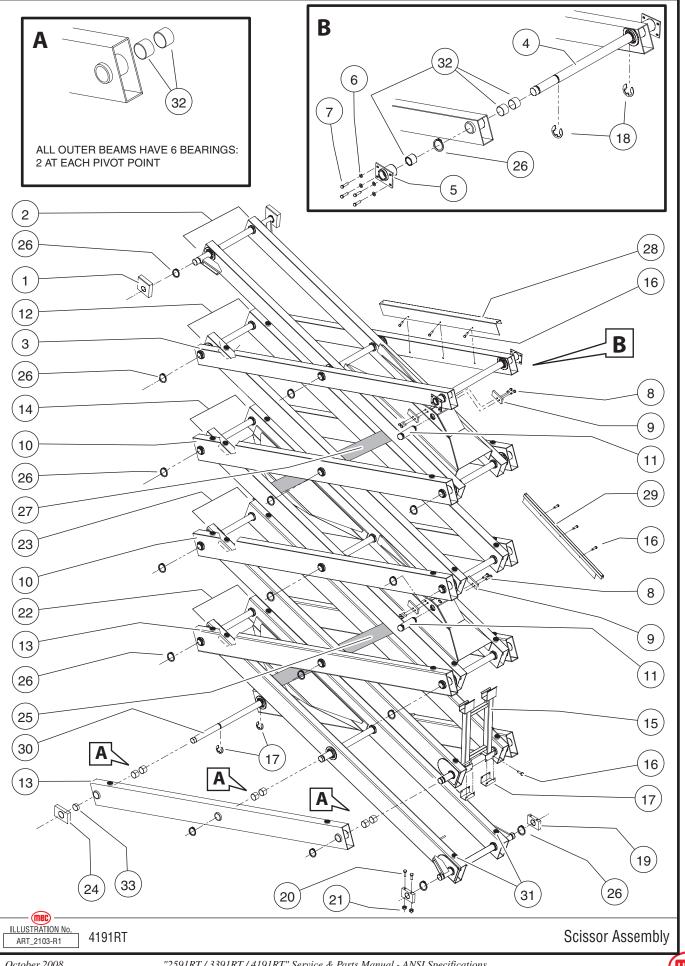




"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY - 3391RT
1	20141	2	BLOCK, SLIDE - PLATFORM
2	20957	1	BEAM, INNER, 3 X 6
3	20939	2	BEAM, OUTER, 3 X 6
4	8340	1	PIN, ROLLER - PLATFORM
5	20365	2	SCISSORS MOUNT ASSEMBLY
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8"-16, 1 3/4" LG
8	20932	6	BEAM, 3 X 8
9	HDW5724	8	SCREW, 5/16"–18, 3/4" LG
10	20223	4	PLATE, CYLINDER PIN LOCK
11	6669	50	BEARING
12	20224	2	PIN, CYLINDER
13	16469	1	BEAM, INNER, CYLINDER MOUNT
14	20778	1	LOCK, MAINTENANCE
15	HDW6455	4	SCREW, 1/4"- 20, 1/2" LG
16	21133	2	BRACKET, MAINTENANCE LOCK
17	6688	4	CLIP RING, 2" SHAFT
18	20429	2	BLOCK, FIXED - BASE
19	HDW8856	4	SCREW, 1/2" - 13, 5" LG
20	HDW6463	4	NUT, 1/2" - 13, NYLON
21	20937	1	BEAM, INNER, CENTER
22	16460	1	BEAM, SINGLE CYLINDER MOUNT
23	20142	2	BLOCK, SLIDE - BASE
24	91403	1	CYLINDER, LIFT
25	6701	24	RING, RETAINING, 2" SHAFT
26	6670	2	BEARING
27	20413	1	PIN, SLIDE, BASE
28	25429	24	SPACER BLOCK

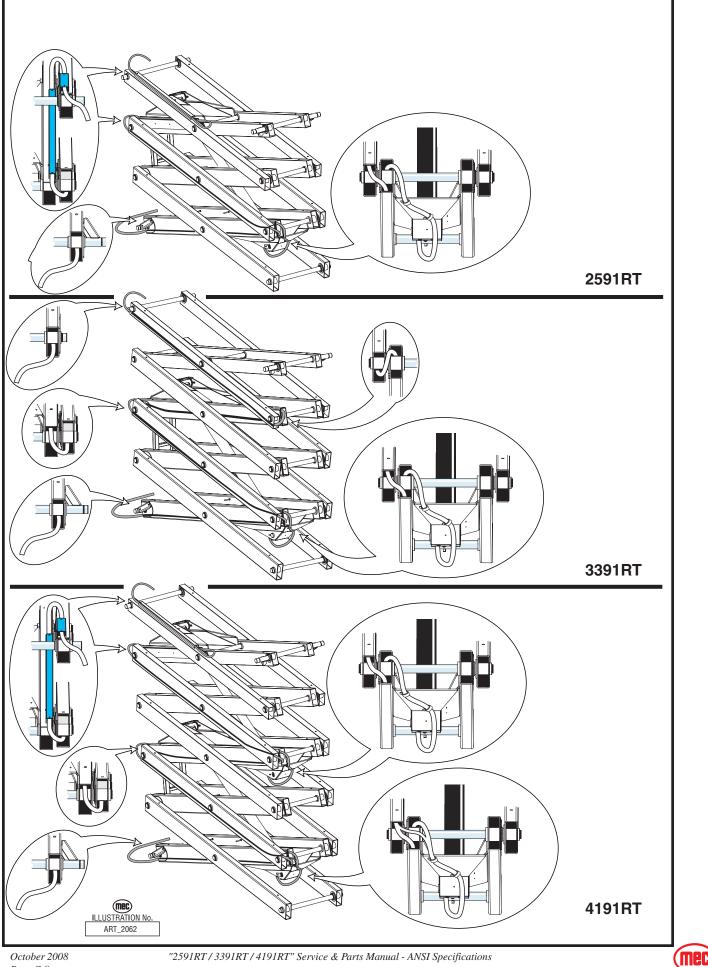






ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY - 4191RT
1	20141	2	BLOCK, SLIDE - PLATFORM
2	20935	1	BEAM, SINGLE CYLINDER MOUNT
3	20939	2	BEAM, OUTER, 3 X 6
4	8340	1	PIN, ROLLER - PLATFORM
5	20365	2	SCISSORS MOUNT ASSEMBLY
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG
8	HDW5724	16	SCREW, 5/16"–18, 3/4" LG
9	20223	8	PLATE, CYLINDER PIN LOCK
10	20938	4	BEAM, OUTER, 3 X 8
11	20224	4	PIN, CYLINDER
12	16467	1	BEAM, INNER, CENTER
13	20932	4	BEAM WELDMENT
14	20933	1	BEAM, DOUBLE CYLINDER MOUNT
15	20778	1	LOCK, MAINTENANCE
16	HDW6455	14	SCREW, 1/4" - 20, 1/2" LG
17	21133	2	BRACKET, MAINTENANCE LOCK
18	6688	4	CLIP RING, 2" SHAFT
19	20429	2	BLOCK, FIXED - BASE
20	HDW8856	4	SCREW, 1/2" - 13, 5" LG
21	HDW6463	4	NUT, 1/2" - 13, NYLON
22	16460	1	BEAM, ¼", SINGLE CYLINDER MOUNT
23	20937	1	BEAM WELDMENT
24	20142	2	BLOCK, SLIDE - BASE
25	91404	1	CYLINDER, LIFT - LOWER
26	6701	30	RING, RETAINING, 2" SHAFT
27	91405	1	CYLINDER, LIFT - UPPER
28	20913	1	GUARD, CONTROL CORD, SHORT
29	20839	1	GUARD, CONTROL CORD
30	20413	1	PIN, SLIDE, BASE
31	25429	32	SPACER BLOCK
32	6669	62	BEARING
33	6670	2	BEARING

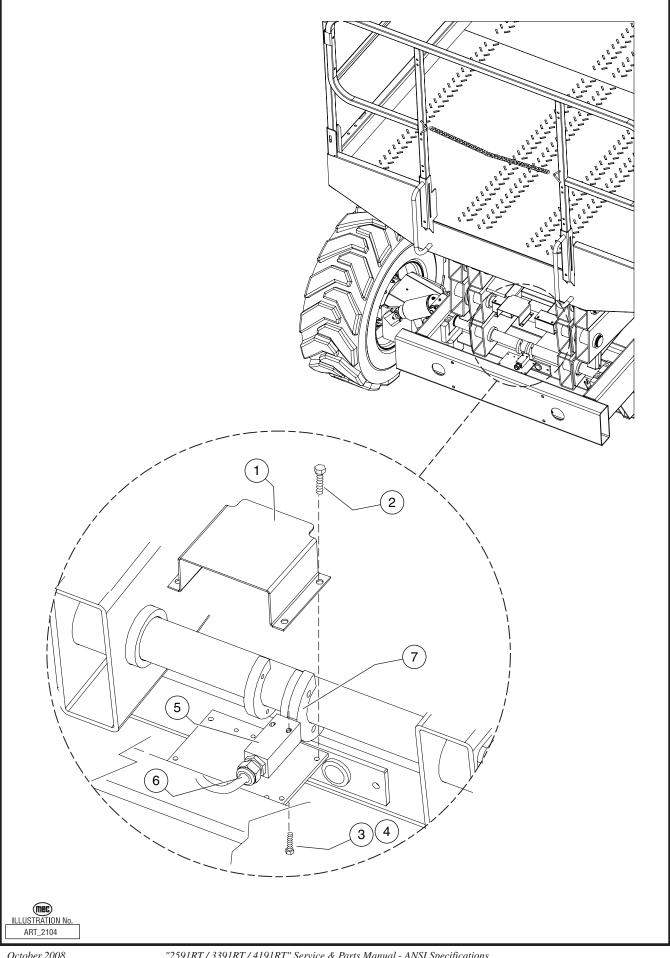




"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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October 2008 Page C-10

"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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ITEM	PART NO.	QTY	DESCRIPTION
			LIMIT SWITCH INSTALLATION
1	20924	1	COVER, LIMIT SWITCH
2	HDW6455	4	SCREW, 1/4"- 20, 1/2" LG
3	HDW8482	2	SCREW, #8-32, 1 1/2" LG
4	HDW5251	2	NUT, #8-32
5	90996	1	SWITCH, LIMIT, 3-POLE
6	7594	1	CONNECTOR, CORD
7	20838	1	CAM, SLOW SPEED



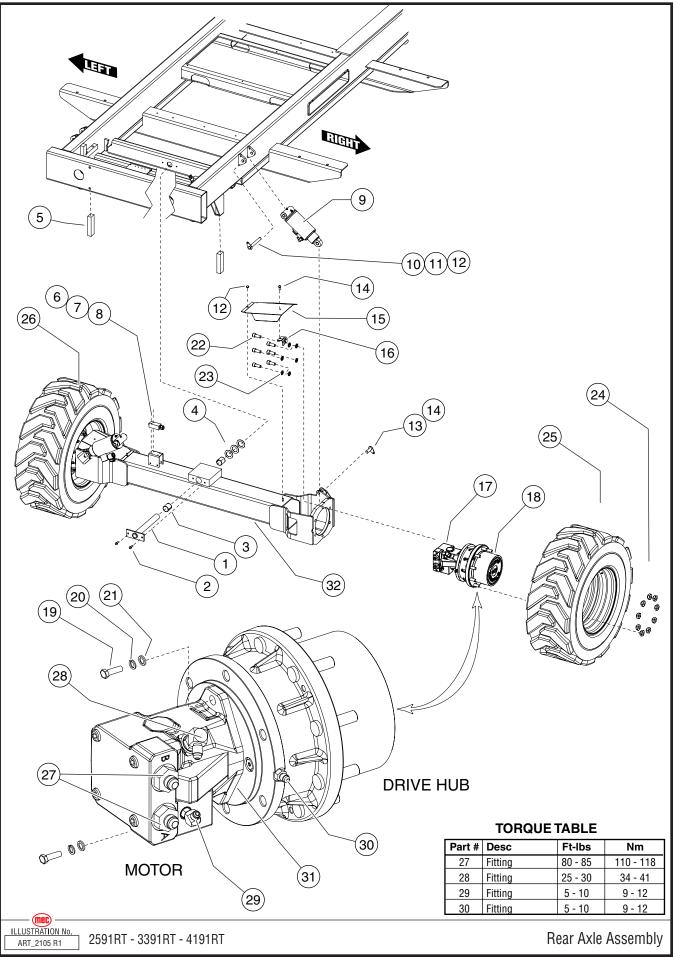
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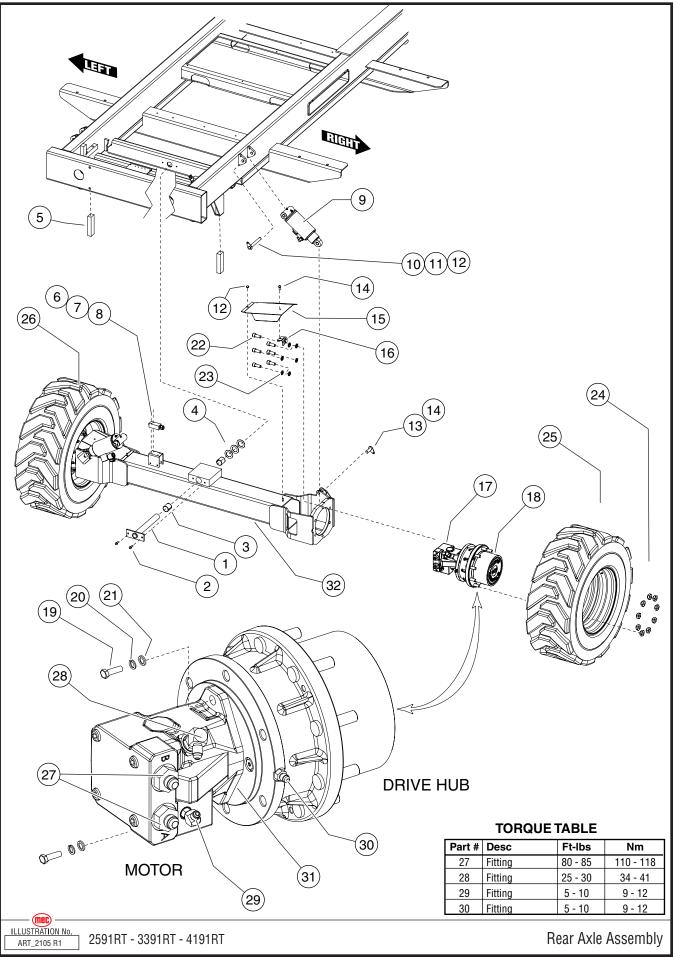
F	Rear Axle Assembly	D-3
	RONT AXLE ASSEMBLY	
	Drive Hub with Brake (Rear)	
	личе Нив (Front)	
)	"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications	October 2008 Page D-1





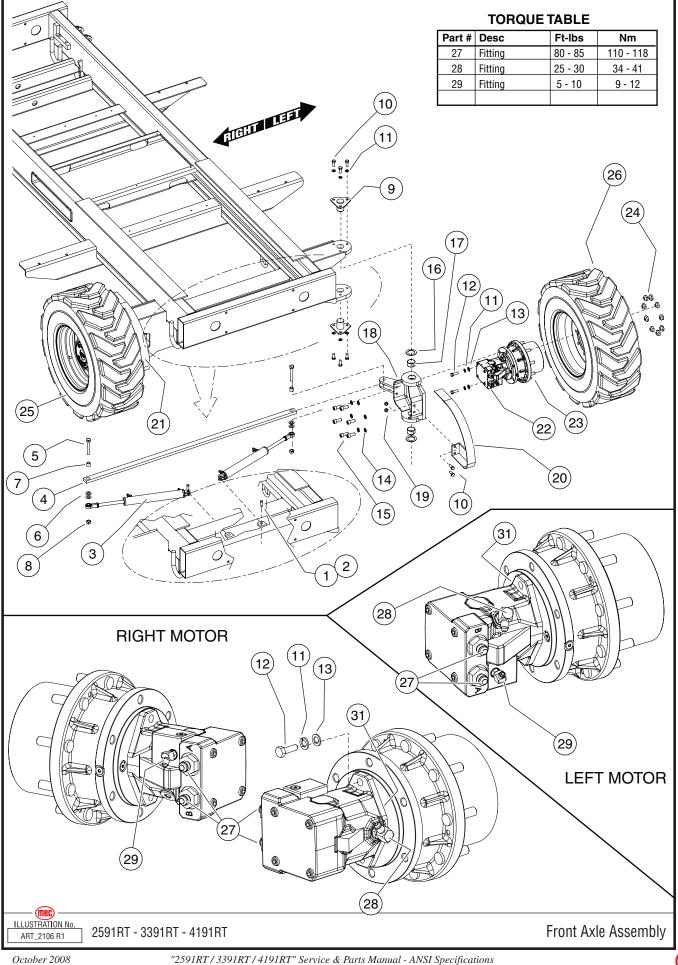


ITEM	PART NO.	QTY	DESCRIPTION
			REAR AXLE ASSEMBLY
1	10423	1	PIVOT PIN WELDMENT
2	HDW5204	2	SCREW, 5/16-18 × 1"
3	6984	2	BEARING, 1 3/8 × 1 5/8" LG
4	HDW13339	3	WASHER, FLAT NYLON, 1 3/8 ID \times 21/4 OD \times .030 THK
5	10424	2	AXLE GUIDE, NYLON
6	90531	1	LIMIT SWITCH, AXLE CENTER POSITION
7	HDW8482	2	SCREW, #8-32 × 1.5" LG
8	HDW5251	2	NUT, #8-32
9	91406	2	AXLE LOCK CYLINDER
10	16478	2	CLEVIS PIN WELDMENT, 5/8" × 5¼"
11	HDW8273	2	SCREW, ¼–20 ×
12	HDW8267	6	NUT, ¼–20
13	16479	2	CLEVIS PIN WELDMENT, 5/8" × 2 1/8"
14	HDW5723	2	SCREW, 1⁄4–20 × 3⁄4"
15	16482	2	COVER, REAR AXLE
16	16484	2	BRACKET, AXLE COVER
17	91402	2	MOTOR, HYDRAULIC DRIVE
	91560		SEAL KIT
18	91400	2	DRIVE HUB W/BRAKE
			(SERVICE PARTS - SEE PAGE D-10 & D-11)
19	HDW8283	4	SCREW, ½–13 × 1½" GR8
20	HDW5012	4	LOCK WASHER, ½"
21	HDW90784	4	WASHER, FLAT, .531 ID \times 1.063 OD \times .104 THK
22	HDW91407	12	SCREW, 5/8–11 × 1½ SOCKET HEAD GR8
23	HDW5994	12	WASHER, LOCK, 5/8"
			CONTINUED



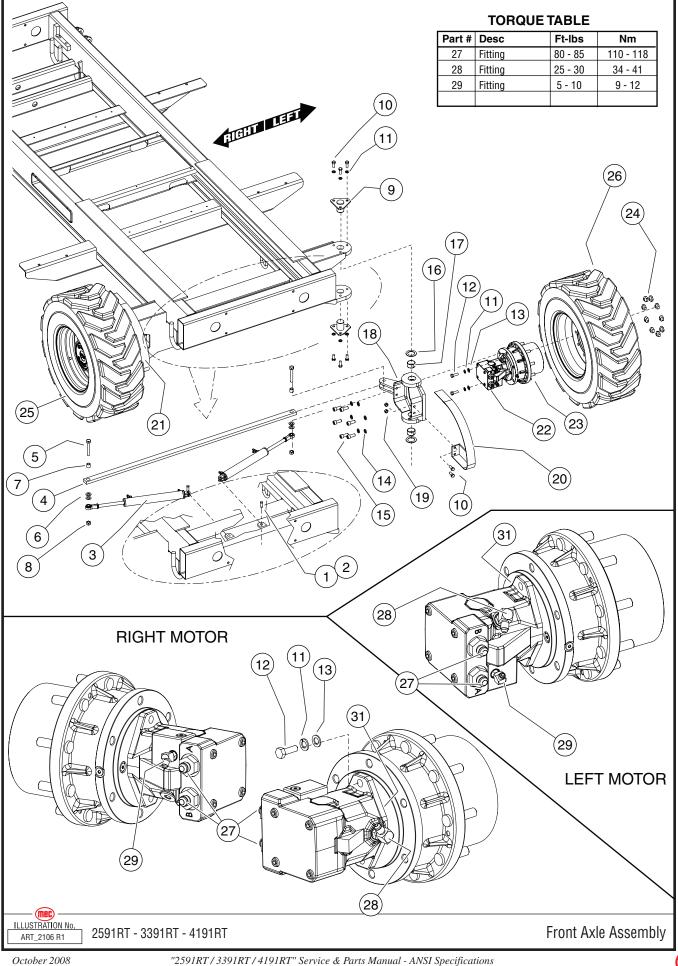


ITEM	PART NO.	QTY	DESCRIPTION
			REAR AXLE ASSEMBLY (CONTINUED)
24	HDW91420	18	NUT, LUG, 5/8–18
25	91411	1	WHEEL TIRE ASSY, RH, AIR FILLED
	91413	1	WHEEL TIRE ASSY, RH, FOAM FILLED OPTION
	91432	1	WHEEL TIRE ASSY, RH, NON-MARKING AIR OPTION
	91445	1	WHEEL TIRE ASSY, RH, NON-MARKING FOAM OPTION
26	91412	1	WHEEL TIRE ASSY, LH, AIR FILLED
	91414	1	WHEEL TIRE ASSY, LH, FOAM FILLED OPTION
	91433	1	WHEEL TIRE ASSY, LH, NON-MARKING AIR OPTION
	91446	1	WHEEL TIRE ASSY, LH, NON-MARKING FOAM OPTION
27	HDW8984	2	FITTING, MB–MJ–12–8
28	HDW8081	1	FITTING, MB–MJ90–8–6
29	HDW91428	1	FITTING, MB–MJ45–4–4
30	HDW8881	1	FITTING, MB–MJ–4–4
31	91419	2	O-RING (NOT SHOWN)
32	16400	—	AXLE REAR WELDMENT



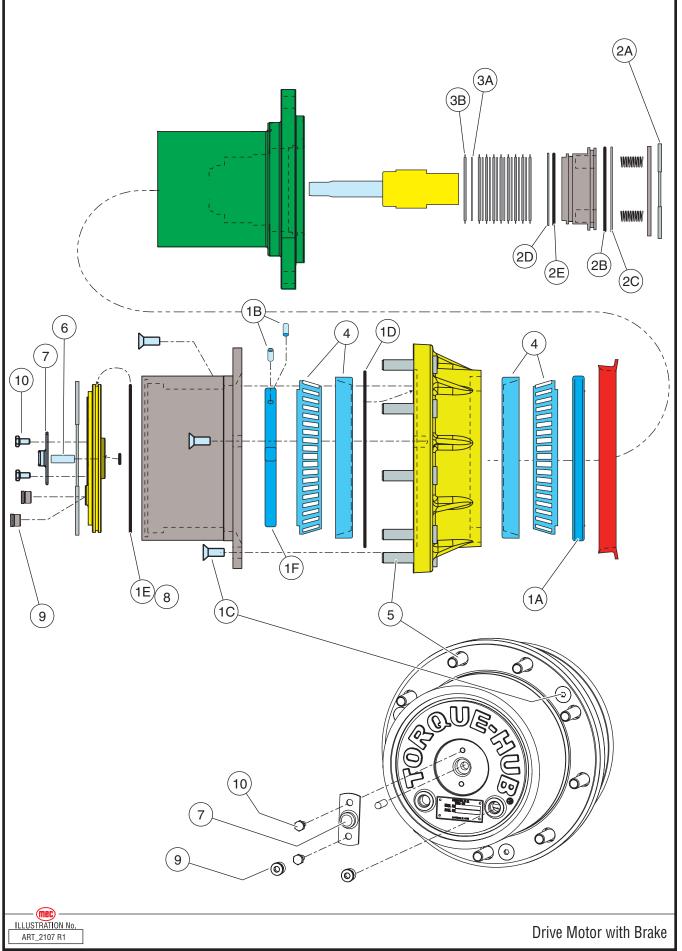


ITEM	PART NO.	QTY	DESCRIPTION
			FRONT AXLE ASSEMBLY
1	HDW5920	2	PIN, COTTER, .12 × 1"
2	HDW90770	2	PIN, CLEVIS, ½ × 1 3/8"
3	91019	1	CYLINDER, STEERING
	90990		SEAL KIT, STEERING CYLINDER (NOT SHOWN)
4	16407	1	BAR, STEERING
5	HDW7326	2	SCREW, 5/8–11 × 4" GR5
6	HDW9219	4	WASHER, .656 ID × 1.312 OD × .093 THK
7	7292	2	BEARING, BRONZE
8	HDW6633	2	NUT, 5/8–11 LOCK
9	16408	4	KING PIN WELDMENT
10	HDW6211	16	SCREW, ½–13 × 1¼" GR5
11	HDW5012	16	LOCK WASHER, 1/2"
12	HDW8283	4	SCREW, ½–13 × 1½" GR8
13	HDW90784	4	WASHER, FLAT, .531 ID \times 1.063 OD \times .104 THK
14	HDW5994	12	WASHER, LOCK, 5/8
15	HDW91047	12	SCREW, 5/8–11 × 1½ SOCKET HEAD GR8
16	91408	4	THRUST BEARING, $1\frac{3}{4}$ ID × 2 5/8 OD × 1/8 THK
17	7896	4	BEARING, 1¾ ID × 1" LG
18	16425	2	STEERING KNUCKLE WELDMENT
19	HDW8457	4	LOCK NUT, 1/2-13
20	16471	1	HOSE GUARD WELDMENT, LH
21	16470	1	HOSE GUARD WELDMENT, RH
22	91402	2	MOTOR, HYDRAULIC DRIVE
	91560		SEAL KIT
23	91401	2	DRIVE HUB
			(SERVICE PARTS - SEE PAGE D-12 & D-13)
			CONTINUED





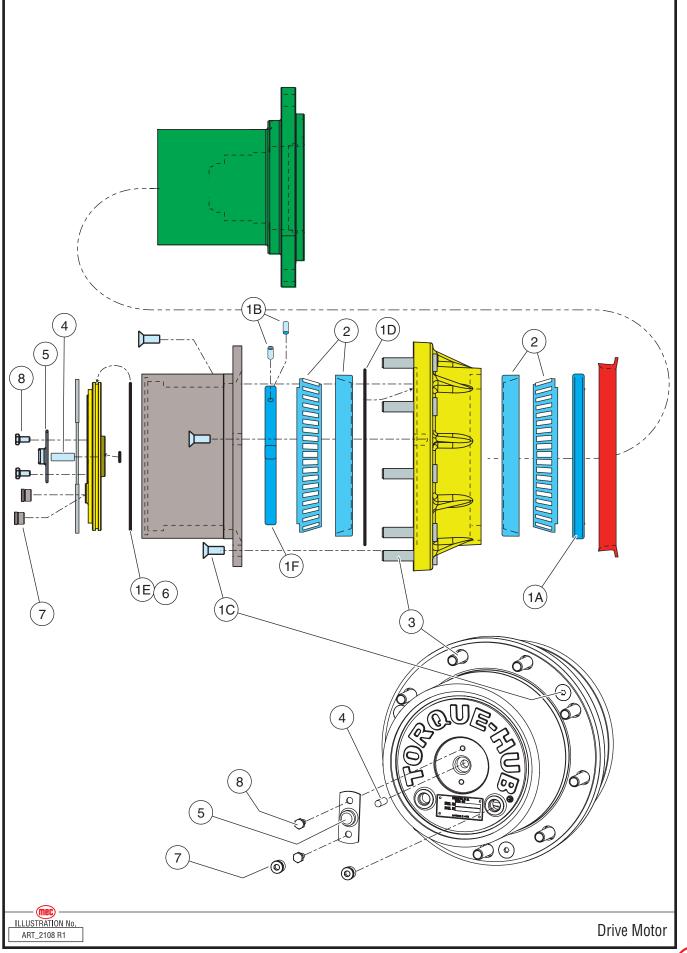
PART NO.	QTY	DESCRIPTION
		FRONT AXLE ASSEMBLY (CONTINUED)
HDW91420	18	NUT, LUG, 5/8–18
91411	1	WHEEL TIRE ASSY, RH, AIR FILLED
91413	1	WHEEL TIRE ASSY, RH, FOAM FILLED OPTION
91432	1	WHEEL TIRE ASSY, RH, NON-MARKING AIR OPTION
91445	1	WHEEL TIRE ASSY, RH, NON-MARKING FOAM OPTION
91412	1	WHEEL TIRE ASSY, LH, AIR FILLED
91414	1	WHEEL TIRE ASSY, LH, FOAM FILLED OPTION
91433	1	WHEEL TIRE ASSY, LH, NON-MARKING AIR OPTION
91446	1	WHEEL TIRE ASSY, LH, NON-MARKING FOAM OPTION
HDW8984	2	FITTING, MB–MJ–12–8
HDW8081	1	FITTING, MB–MJ90–8–6
HDW91428	1	FITTING, MB–MJ45–4–4
91419	2	O-RING (NOT SHOWN)
	HDW91420 91411 91413 91432 91445 91445 91412 91414 91433 91446 HDW8984 HDW8984 HDW8081	HDW9142018914111914131914321914451914451914121914131914331914461HDW89842HDW80811HDW914281







ITEM	PART NO.	QTY	DESCRIPTION
			Drive Hub with Brake (Rear)
	91400		DRIVE HUB
1	91562		SEAL KIT
1A		1	SEAL, LIP
1B		2	SCREW, SET-SOCKET
1C		3	BOLT, FLAT HEAD - HEX SOCKET
1D		1	O–RING
1E	91569	1	O-RING, END COVER (AVAILABLE SEPARATE FROM KIT)
1F		1	NUT, BEARING
2	91563		BRAKE SEAL KIT
2A		1	RETAINER, RING - INTERNAL
2B		1	O-RING
2C		1	O-RING, BACK-UP
2D		1	O-RING, BACK-UP
2E		1	O-RING
3	91564		BRAKE LINING KIT (INCLUDES SEAL KIT 91563)
ЗA		8	REACTION DISC, BRAKE ROTOR
3B		9	FRICTION DISC, BRAKE, STATOR
4	91565	2	BEARING ASSEMBLY
5	91566	9	WHEEL STUD
6	91567	1	DISENGAGE ROD
7	91568	1	DISENGAGE CAP
8	91569	1	END CAP O-RING
9	91571	2	END COVER PLUG
10	HDW5633	2	SCREW ¼–20 × ½" LG
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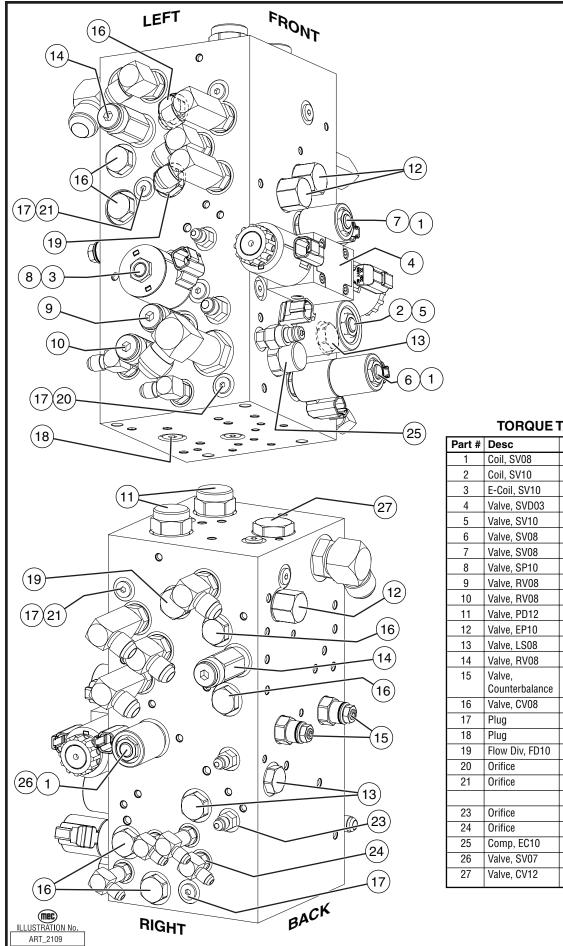
ITEM	PART NO.	QTY	DESCRIPTION
			DRIVE HUB (FRONT)
	91401		DRIVE HUB
1	91562		SEAL KIT
1A		1	SEAL, LIP
1B		2	SCREW, SET-SOCKET
1C		3	BOLT, FLAT HEAD - HEX SOCKET
1D		1	O–RING
1E	91569	1	O-RING, END COVER (AVAILABLE SEPARATE FROM KIT)
1F		1	NUT, BEARING
4	91565	2	BEARING ASSEMBLY
5	91566	9	WHEEL STUD
6	91567	1	DISENGAGE ROD
7	91568	1	DISENGAGE CAP
8	91569	1	END CAP O-RING
9	91571	2	END COVER PLUG
10	HDW5633	2	SCREW ¼–20 × ½" LG

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SECTION E: HYDRAULICS

91410 MANIFOLD ASSEMBLY	E-3
Manifold Assembly – Hardware	E-5
Manifold - Outrigger (Option)	E-7
Hose Kit - Drive	E-9
Hose Kit: Pump and Tank Return	E-11
Hose Kit: Brake & Oscillating Axle	
Hose Kit: Steering	E-13
Hose Kit: Wheel Motor Case Drain	E-13
Hose Kit: Outrigger Option	E-15
Hose KIT - GENERATOR OPTION	E-17
LIFT CYLINDER, 2591RT, 3391RT	
LIFT CYLINDER, LOWER, 4191RT	E-21
LIFT CYLINDER, UPPER, 4191RT	E-23
STEERING CYLINDER	E-25
FLOATING AXLE LOCK CYLINDER	E-27
Outrigger Cylinder (Option)	E-29
"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications	October 2008 Page E-1







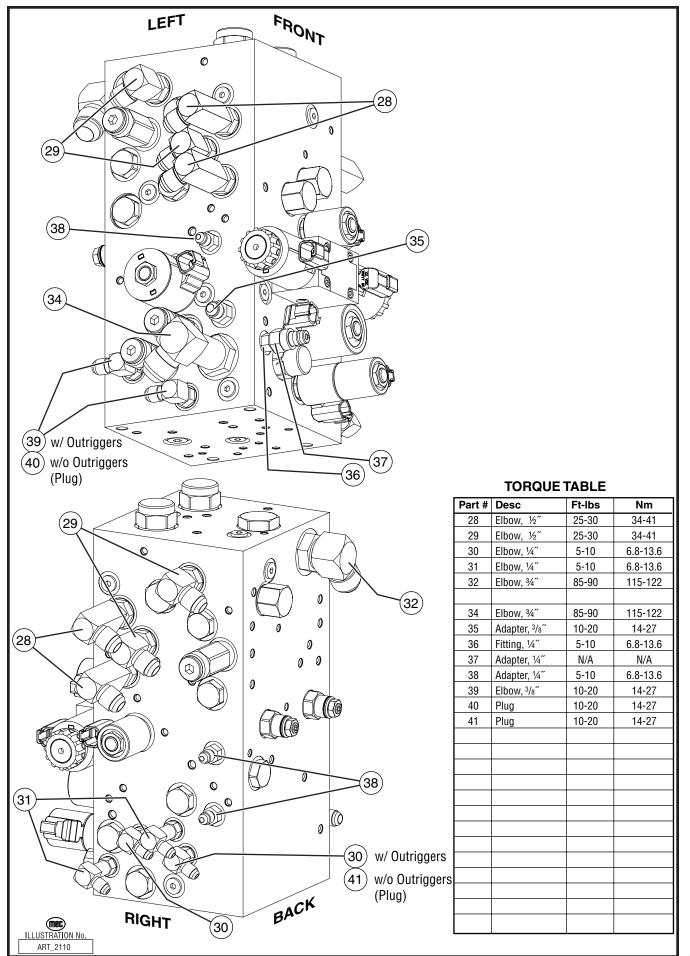
Part #	Desc	Ft-lbs	Nm
1	Coil, SV08	4-5	4.5-6.8
2	Coil, SV10	5-7	6.8-9.5
3	E-Coil, SV10	7-10	9.5-13.6
4	Valve, SVD03	6-8	8.5-10.5
5	Valve, SV10	25-27	34.0-36.7
6	Valve, SV08	18-20	24.5-27.2
7	Valve, SV08	18-20	24.5-27.2
8	Valve, SP10	25-27	34.0-36.7
9	Valve, RV08	18-20	24.5-27.2
10	Valve, RV08	18-20	24.5-27.2
11	Valve, PD12	33-37	44.9-50.3
12	Valve, EP10	25-27	34.0-36.7
13	Valve, LS08	18-20	24.5-27.2
14	Valve, RV08	18-20	24.5-27.2
15	Valve,		
	Counterbalance	18-20	24.5-27.2
16	Valve, CV08	12-14	16.3-19.0
17	Plug	10-20	13.5-27.2
18	Plug	10-20	13.5-27.2
19	Flow Div, FD10	25-27	34.0-36.7
20	Orifice	N/A	N/A
21	Orifice	N/A	N/A
23	Orifice	N/A	N/A
24	Orifice	N/A	N/A
25	Comp, EC10	25-27	34.0-36.7
26	Valve, SV07	18-20	24.5-27.2
27	Valve, CV12	33-37	44.9-50.3

October 2008 Page E-2

"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications



ITEM	PART NO.	QTY	DESCRIPTION
	91410		Manifold Assembly
1	91141	4	COIL, SERIES 8, 12V
2	91142	1	COIL, SERIES 10, 12V
3	91143	1	COIL, SERIES 10 E-COIL, 12V
4	91144	1	VALVE, DRIVE, 4 WAY 3 POSITION
5	91145	1	VALVE, LIFT SPOOL, 3 WAY 2 POSITION
6	91146	1	VALVE, STEER, 4 WAY 3 POSITION
7	91147	1	VALVE, TORQUE, SPOOL, 4 WAY 2 POSITION
8	91148	1	VALVE, PROPORTIONAL, 12 V
9	91149	1	VALVE, RELIEF, LIFT
10	91150	1	VALVE, RELIEF, STEER
11	91151	2	VALVE, PILOTED SPOOL 4 WAY 3 POSITION
12	91152	3	VALVE, PILOTED POPPET
13	91153	3	VALVE, LOAD SHUTTLE CHECK
14	91476	2	VALVE, RELIEF, DRIVE
15	91350	2	VALVE, COUNTERBALANCE
16	91477	7	VALVE, CHECK
17	HDW7314	12	PORT PLUG M ¼", O-RING, RBG-4
18	7484	2	PORT PLUG M 0.38" O-RING, RBG-6
19	91351	2	FLOW DIVIDER / COMBINER
20	91355	1	ORIFICE PLUG, STEER
21	91356	2	ORIFICE PLUG, FLOW DIVIDER BLEED
23	91474	1	ORIFICE PLUG, BRAKE
24	91475	1	ORIFICE PLUG, COMPENSATOR
25	91352	1	PRESSURE COMPENSATOR
26	91472	1	VALVE, SPEED SPOOL 3 WAY 2 POSITION
27	91473	1	CHECK VALVE, TANK RETURN

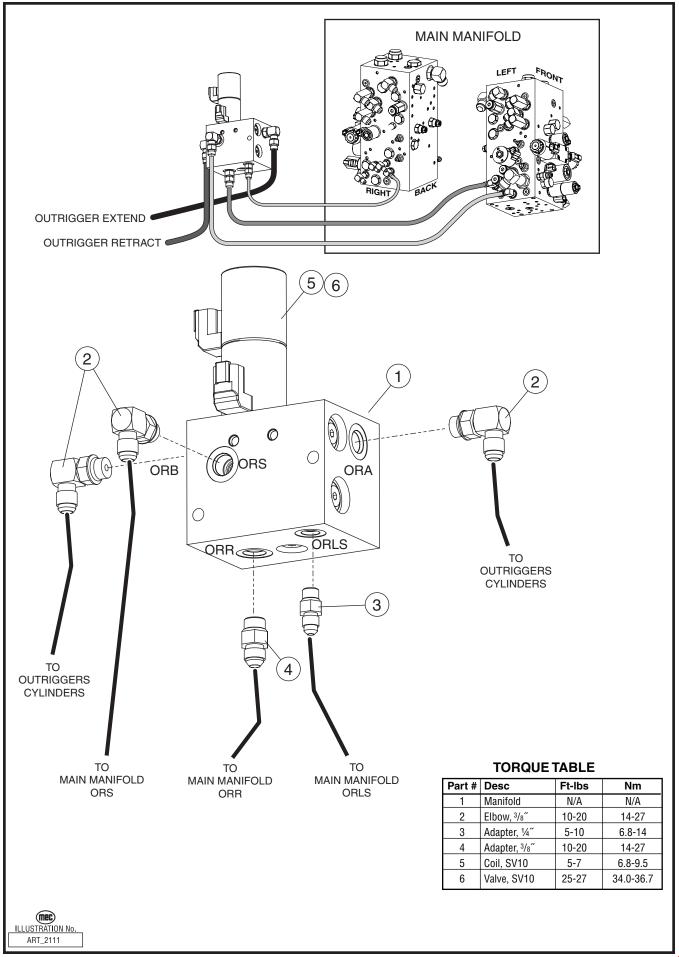


October 2008 Page E-4

"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications



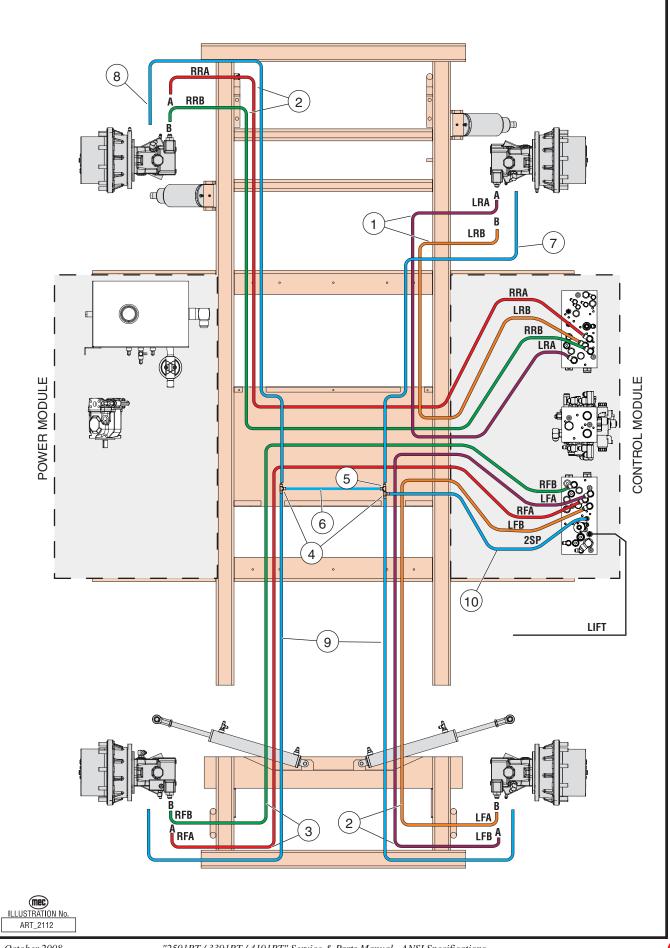
ITEM	PART NO.	QTY	DESCRIPTION	
			Manifold Assembly – Hardware	
28	HDW91248	4	ELBOW, 90°, MALE, 1⁄2", O-RING, MALE, 1⁄2", MB-MJ90LL-8-8	
29	HDW90764	4	ELBOW, 90°, MALE, 1⁄2", O-RING, MALE, 1⁄2", MB-MJ90-8-8	
30	HDW8877	2	ELBOW, 90°, MALE ¼" O-RING, MALE ¼", MB-MJ90-4-4	
31	HDW91081	1	ELBOW, 90°, MALE ¼" O-RING, MALE ¼", MB-MJ90LL-4-4	
32	HDW91244	1	ELBOW, 90°, MALE 3/4" O-RING, MALE 3/4", MB-MJ90-12-12	
34	HDW91245	1	ELBOW, 90°, M ¾" O-RING, M ¾",MB-MJ90LL-12-12	
35	HDW7438	1	ADAPTER, MALE 3/8 O-RING, MALE 3/8 JIC, MB-MJ-6-6	
36	HDW7971	1	FITTING, MALE DISCONNECT, 1/4" NPT	
37	HDW91243	1	ADAPTER MALE 1/4" ORNG M 1/4" NTP, MP-MB-4-4	
38	HDW8881	3	ADAPTER, MALE ¼", O-RING, MALE ¼" 37° MB-MJ-4-4	
39	HDW7601	2	ELBOW, 90°, MALE 3/8 O-RING, MALE 3/8 JIC, MB-MJ90-6-6	
40	7484	2	PLUG (WITHOUT OUTRIGGER OPTION)	
41	HDW7314	1	PLUG (WITHOUT OUTRIGGER OPTION)	



October 2008 Page E-6

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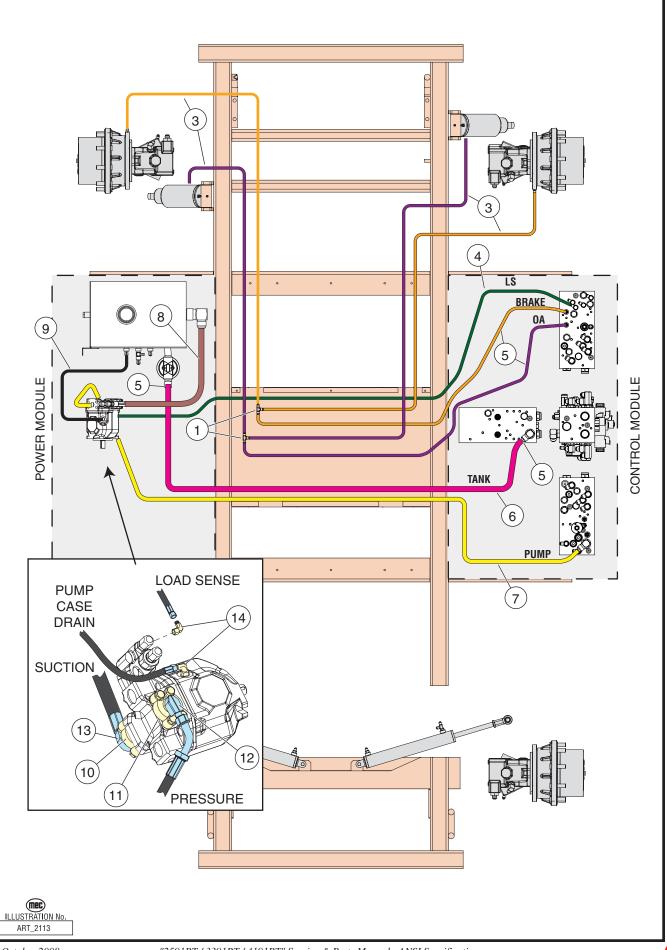
ITEM	PART NO.	QTY	DESCRIPTION
			Manifold - Outrigger (Option)
			SEE HOSE KIT FOR HOSES
1	91268	1	MANIFOLD ASSEMBLY
2	HDW7601	3	ELBOW 90° MALE 3/8" O-RING - MALE 3/8" JIC
3	HDW8881	1	ADAPTER MALE ¼" O-RING - MALE ¼" JIC
4	HDW7438	1	ADAPTER MALE 3/8" O-RING - MALE 3/8" JIC
5	91142	2	COIL
6	91008	1	VALVE SPOOL 4-WAY 3-POSITION
<u> </u>			
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October 2008 Page E-8 "2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications

Mec

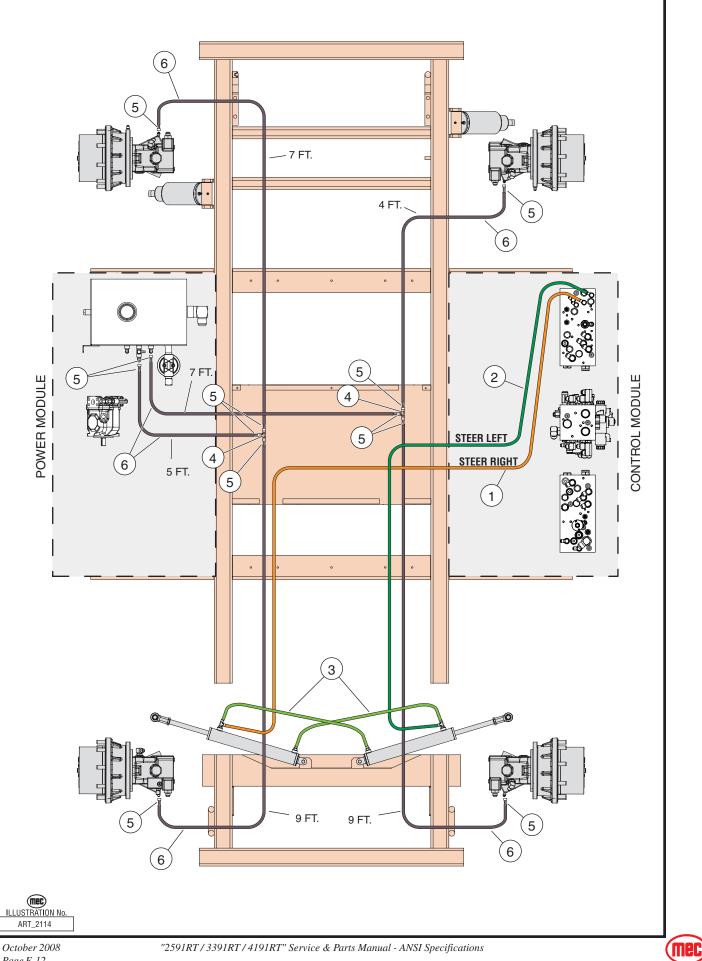
ITEM	PART NO.	QTY	DESCRIPTION
			Hose Kit - Drive
	84020		HOSE KIT
1	91425	2	HOSE ASSY, ½"×74", 8M3K-8FJX-8FJX45-74"
2	91426	4	HOSE ASSY, 1/2"×116", 8M3K-8FJX-8FJX45-116"
3	91427	2	HOSE ASSY, ½"×148", 8M3K-8FJX-8FJX45-148"
4	HDW9557	4	TEE, M ¼ JIC M ¼ JIC
5	HDW90332	1	TEE, FEMALE ¼ JIC × MALE ¼ JIC
6	90275	1	HOSE ASSY, ¼" × 17", 4G1-4FJX-4FJX-17
7	9393	1	HOSE ASSY, ¼" × 48", 4G1-4FJX-4FJX-48
8	9847	2	HOSE ASSY, ¼" × 76", (4G1-4FJX-4FJX)
9	8884	3	HOSE ASSY, ¼" × 106", 4G1-4FJX-4FJX-106
10	91256	3	HOSE ASSY, ¼"×42", 4G1-4FJX-4FJX90S
			LIFT HOSES
			SEE CYLINDER ART
			CONTINUED





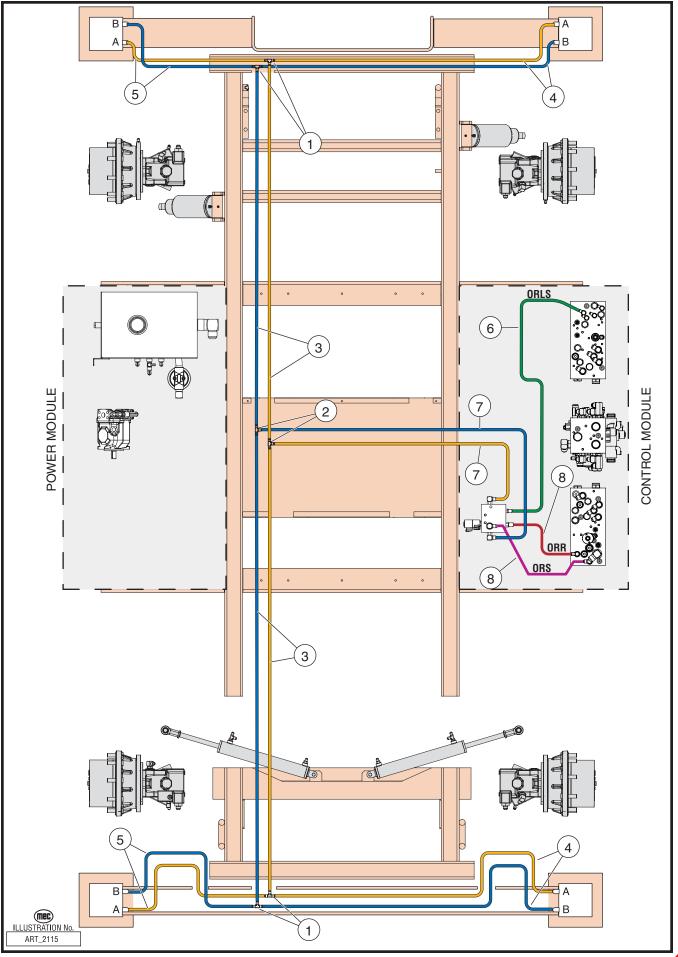


ITEM	PART NO.	QTY	DESCRIPTION
			Hose Kit: Brake & Oscillating Axle
	84020		HOSE KIT (CONTINUED)
1	HDW9557	4	TEE, M ¼ JIC M ¼ JIC
2	91256	3	HOSE ASSY, ¼"×42", 4G1-4FJX-4FJX90S
3	9227	4	HOSE ASSY, ¼"×83", 4G1-4FJX-4FJX90S
			Hose Kit: Pump and Tank Return
4	9847	2	HOSE ASSY, ¼" × 76", (4G1-4FJX-4FJX)
5	HDW91246	2	FITTING FEMALE 3/4" JIC MALE 3/4" HOSE BARB
6	91247	8FT	HOSE ASSY, ¾", 12LOLA BULK
7	91423	1	HOSE ASSY, ¾" × 82", (12M3K-12FJX-12FJX45)
8	91265	1	HOSE ASSY, 1" × 22", (16GMV-16FJX-16FJX-22")
9	90276		HOSE ASSY, ¼"×24",(4G1-4FJX-6FJX-24)
10	91161	1	FLANGE KIT #16
11	91162	1	FLANGE KIT #12
12	91163	1	ADAPTER 34" FLANGE, MALE 34" JIC 90°
13	HDW91176	1	ADAPTER 1" FLANGE, MALE 1" JIC
14	HDW8877	2	ELBOW, 90°, MALE ¼" O-RING, MALE ¼" JIC
			CONTINUED





ITEM	PART NO.	QTY	DESCRIPTION
		<u> </u>	Hose Kit: Steering
	04000		
	84020		HOSE KIT (CONTINUED)
<u> </u>			
1	8884	3	HOSE ASSY, ¼" × 106", 4G1-4FJX-4FJX-106
2	9755	1	HOSE ASSY, ¼" × 84", 4G1-4FJX-4FJX-84
3	91421	2	HOSE ASSY, ¼" × 25", 4G1-4FJX90S-4FJX90S-25
			Hose Kit: Wheel Motor Case Drain
4	HDW7391	2	TEE, MALE 3/8 JIC
5	HDW91436	12	ADAPTER, FEMALE 3/8 JIC \times MALE 3/8 HOSE BARB
6	91435	41FT	
			CONTINUED

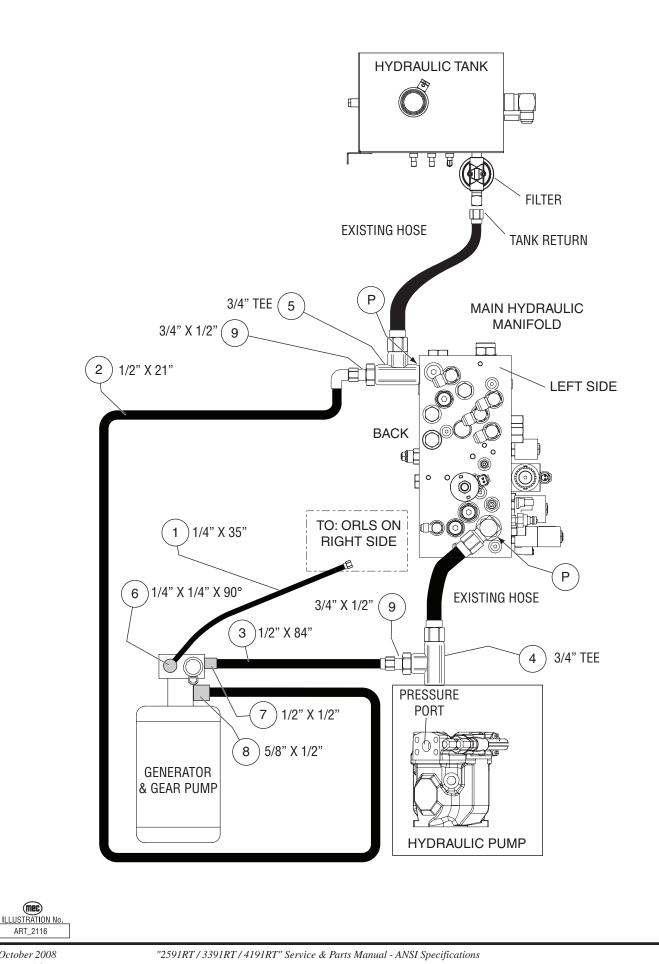




"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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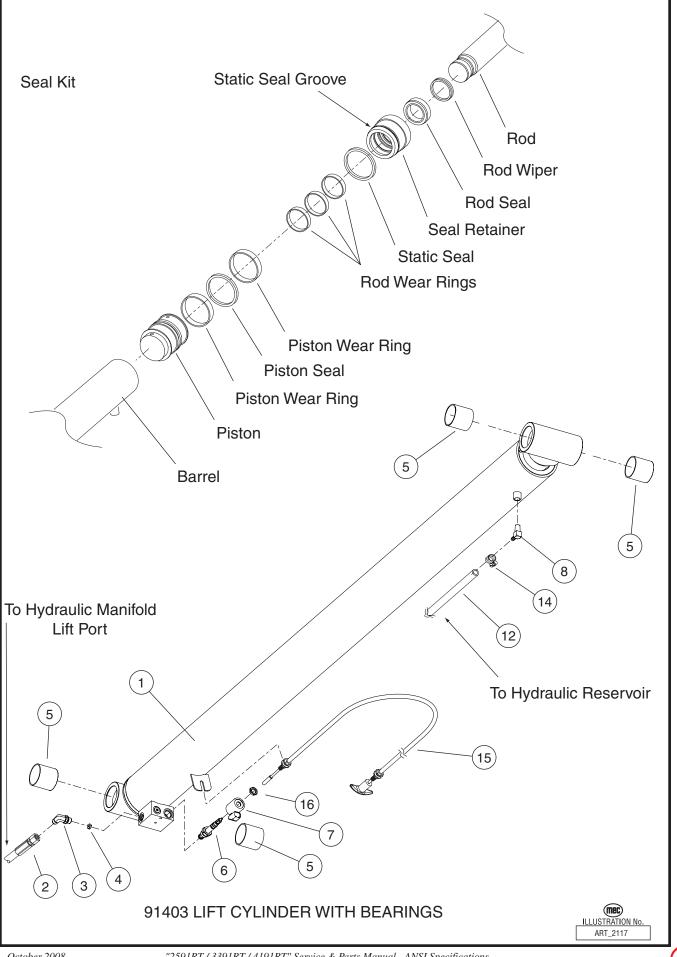
ITEM	PART NO.	QTY	DESCRIPTION
			Hose Kit: Outrigger Option
	84020		HOSE KIT (CONTINUED)
1	HDW9557	4	TEE, MALE ¼" JIC
2	HDW7391	2	TEE, MALE 3/8" JIC
		2	TEE, MALE 0/0 010
3	91422	4	HOSE ASSY, ¼"×74" (4G1-4FJX-6FJX)
4	91459	4	HOSE ASSY, 1/4"×44" (4G1-4FJX-4FJX90 S)
5	90281	4	HOSE ASSY, ¼"×73" (4G1-4FJX-4FJX90 S)
6	91424	1	HOSE ASSY, ¼"×26" (4G1-4FJX-4FJX)
7	9038	2	HOSE ASSY, 3/8"×46" (6M3K-6FJX-6FJX)
8	8318	2	HOSE ASSY 3/8"×24" (6M3K-6FJX-6FJX90)
	I	1	1



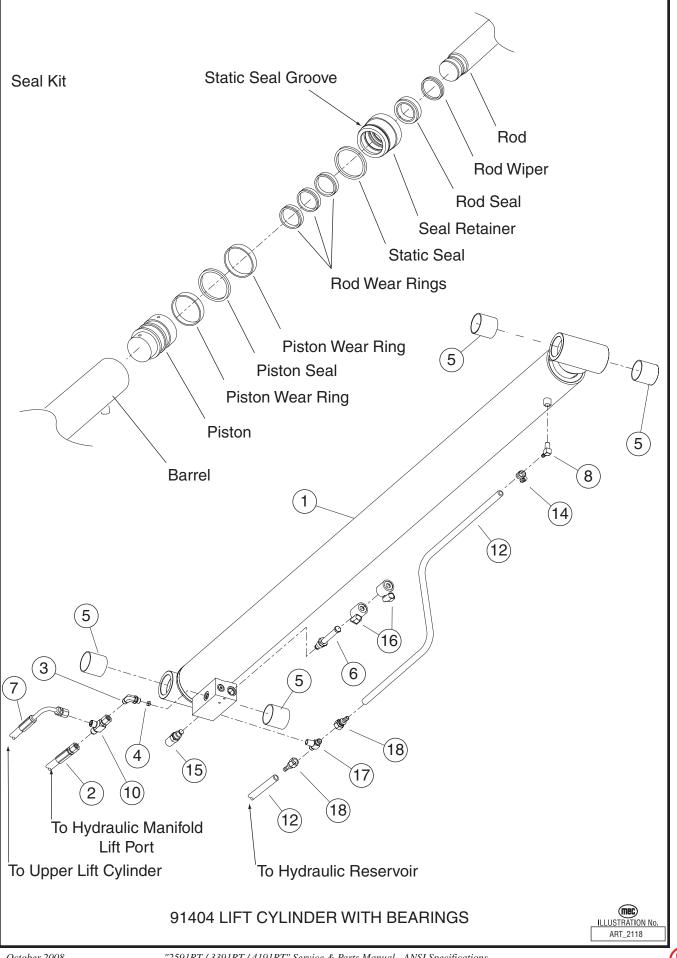
October 2008 Page E-16

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ITEM	PART NO.	QTY	DESCRIPTION
			Hose kit - Generator Option
1	91346	1	HOSE ASSY, ¼" × 35" (4GI–4FJX–4FJX90S)
2	90315	1	HOSE ASSY, ½" × 21" (8M3K–8FJX–8FJX90S)
3	91259	1	HOSE ASSY, ½" × 84" (8M3K–8FJX–8FJX45)
4	HDW91467	1	ADAPTER, TEE, ¾" W/SWIVEL FEMALE
5	HDW91466	1	ADAPTER, TEE, 3/4" MALE O-RING, 3/4" MALE JIC
6	HDW8877	1	ADAPTER, MALE ¼" O-RING, MALE ¼" JIC 90°
7	HDW90764	1	ADAPTER, MALE 1/2" O-RING, MALE 1/2" JIC 90°
8	HDW90967	1	ADAPTER, MALE 5/8" O-RING, MALE 1/4" JIC 90°
9	HDW91468	2	ADAPTER, FEMALE 3/4 JIC, MALE 1/2 JIC

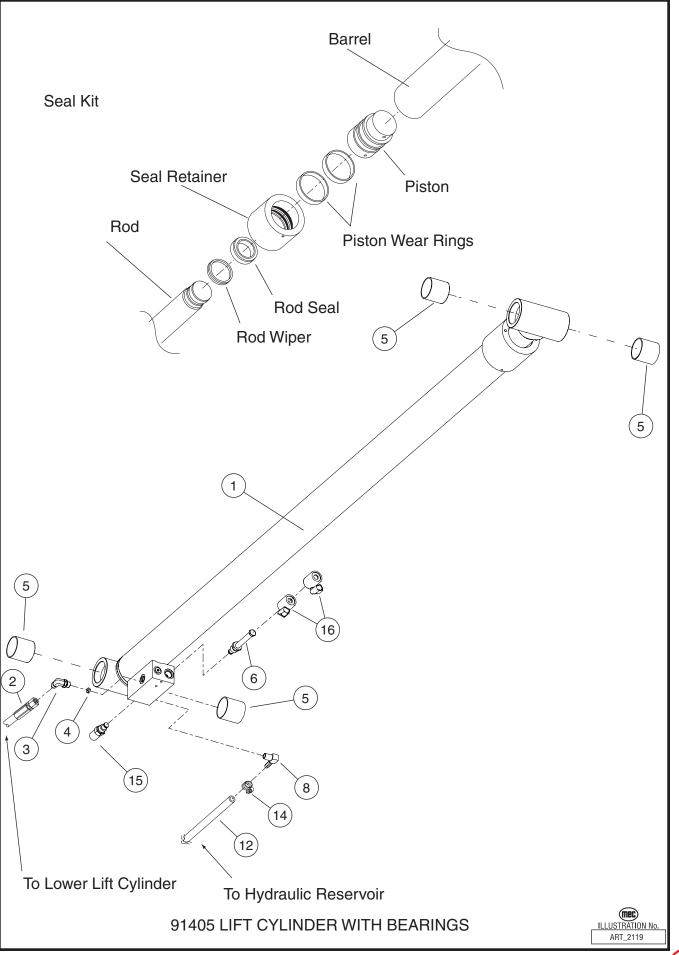


ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, 2591RT, 3391RT
1	91403	1	CYLINDER, LIFT
2	91437	1	HOSE ASSEMBLY, 3/8"× 320"
3	HDW7601	1	FITTING, ELBOW ADAPTOR
4	9767	1	ORIFICE
5	6669	4	BEARING
6	91051	1	VALVE, 2 WAY, N.C. CABLE ATTACH
7	91141	1	COIL, 12 VOLT, DEUTSCH
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
12	6458	21 FT	HOSE, RETURN LINE
14	7788	1	CLAMP, HOSE
15	91442	1	CABLE, E-DOWN
16	HDW91240	1	NUT, COUPLING 10-32 \times ³ / ₄ "
	91461	REF	KIT, SEAL-LIFT CYLINDER (SERVICE)
N/A	91448	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)



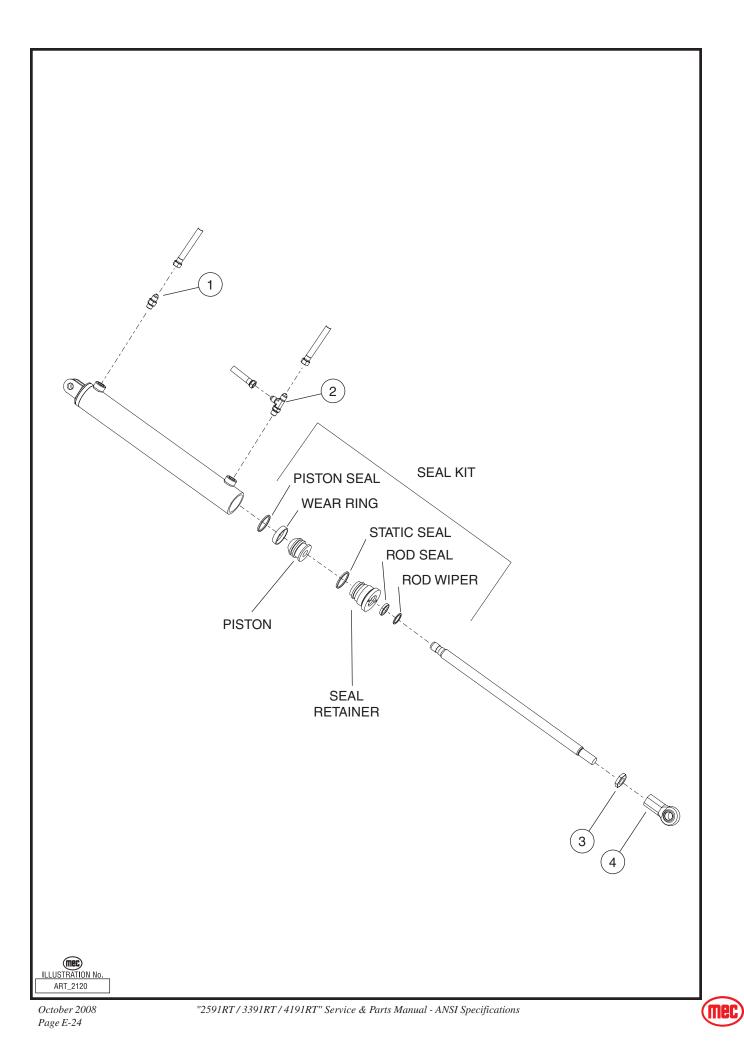


ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, LOWER, 4191RT
	01404		
1	91404	1	
2	91437	1	HOSE ASSEMBLY, LIFT CYLINDER 3/8"×320"
3	HDW7601	1	FITTING, ELBOW 90° ADAPTOR
4	9767	1	ORIFICE
5	6669	4	BEARING, 2" ID \times 2" LG
6	91462	1	VALVE, 2 WAY, N.C. POPPET DUAL COIL
7	91438	1	HOSE ASSEMBLY, 3/8"×352"
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
10	HDW8699	1	FITTING, TEE 3/8" JIC
12	6458	21 FT	HOSE, RETURN LINE
14	7788	1	CLAMP, HOSE
15	90969	1	RELIEF VALVE
16	91141	2	COIL, 12 VOLT, DEUTSCH CONNECTOR W/DIODE
17	HDW90943	1	FITTING, TEE ADAPTOR
18	HDW90945	2	FITTING, FEMALE SWIVEL
	91449	REF	KIT, SEAL-LIFT CYLINDER - LOWER (SERVICE)
N/A	91440	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)
		I	

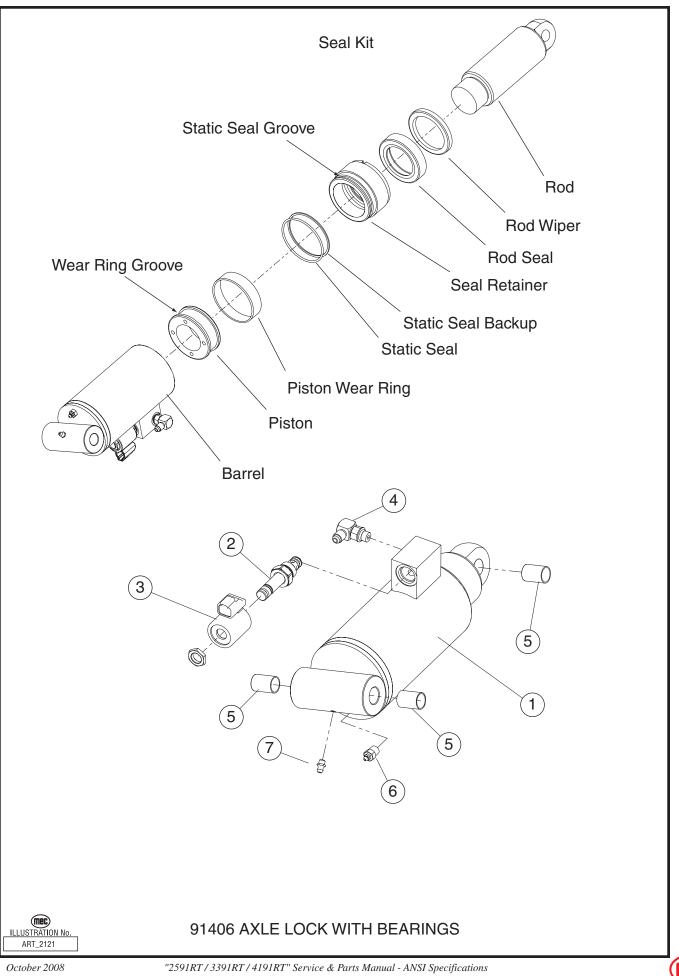




ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, UPPER, 4191RT
1	91405	1	CYLINDER, UPPER LIFT
2	91438	1	HOSE ASSEMBLY, LIFT CYLINDER 3/8" × 352"
3	HDW7601	1	FITTING, ELBOW ADAPTOR
4	90439	1	ORIFICE
5	6669	4	BEARING, 2" ID × 2" LG
6	91462	1	VALVE, 2 WAY, N.C. DUAL COIL
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
12	6458	40 FT	HOSE, 5/16", RETURN LINE
14	7788	1	CLAMP, HOSE
15	90969	1	RELIEF VALVE
16	91141	2	COIL, 12 VOLT, DEUTSCH CONNECTOR W/DIODE
	91450	REF	KIT, SEAL-LIFT CYLINDER (SERVICE)
N/A	91441	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)

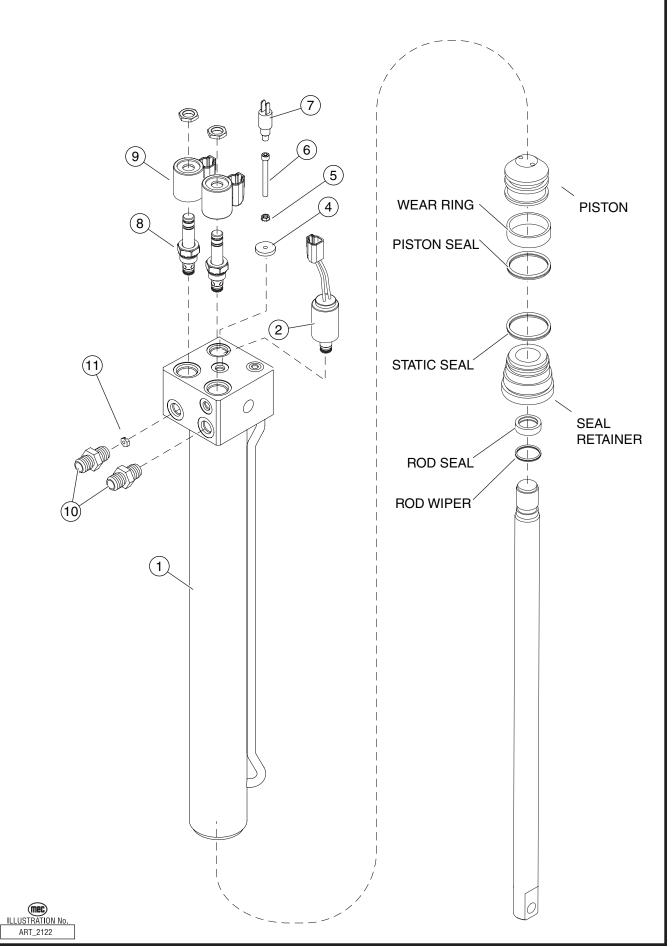


ITEM	PART NO.	QTY	DESCRIPTION
			STEERING CYLINDER
1	91019	2	STEERING CYLINDER
1	HDW8881	1	ADAPTER MALE 1/4" O-RING-MALE 1/4" JIC
2	HDW8876	1	ADAPTER MALE ¼ O-RING-MALE ¼" JIC TEE
3	HDW5925	1	JAMNUT 5/8-18
4	7293	1	ROD END
	90990	REF	SEAL KIT (SERVICE)



Page E-26

ITEM	PART NO.	QTY	DESCRIPTION
			FLOATING AXLE LOCK CYLINDER
1	91406	2	AXLE LOCK CYLINDER
2	91499	1	VALVE, POPPET
3	91142	1	COIL, 12V
4	HDW8877	1	FITTING, ELBOW ADAPTOR
5	91498	3	BEARING, 5/8 X 1
6	91497	1	BLEEDER FITTING
7	91105	1	GREASE FITTING
	91496	REF	SEAL KIT (SERVICE)
<u> </u>			
<u> </u>			
	<u> </u>		





"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications

ITEM	PART NO.	QTY	DESCRIPTION
			OUTRIGGER CYLINDER (OPTION)
1	91443	4	CYLINDER, OUTTRIGGER
2	91281	1	SWITCH, OUTRIGGER PRESSURE N.O.
4	10907	1	WASHER ACTUATOR
5	HDW8476	1	NUT JAM ¼-20
6	HDW9761	1	SCREW, SOCKET HEAD ¼-20 × 2½
7	91277	1	SWITCH, OUTRIGGER RETRACT LIMIT N.O.
8	91464	2	VALVE N.C. POPPET
9	91141	2	COIL 12V DEUTSCH
10	HDW91465	2	ADAPTER 3/8 MALE O-RING, ¼ MALE JIC
11	90439	1	ORIFICE
	91451	REF	SEAL KIT

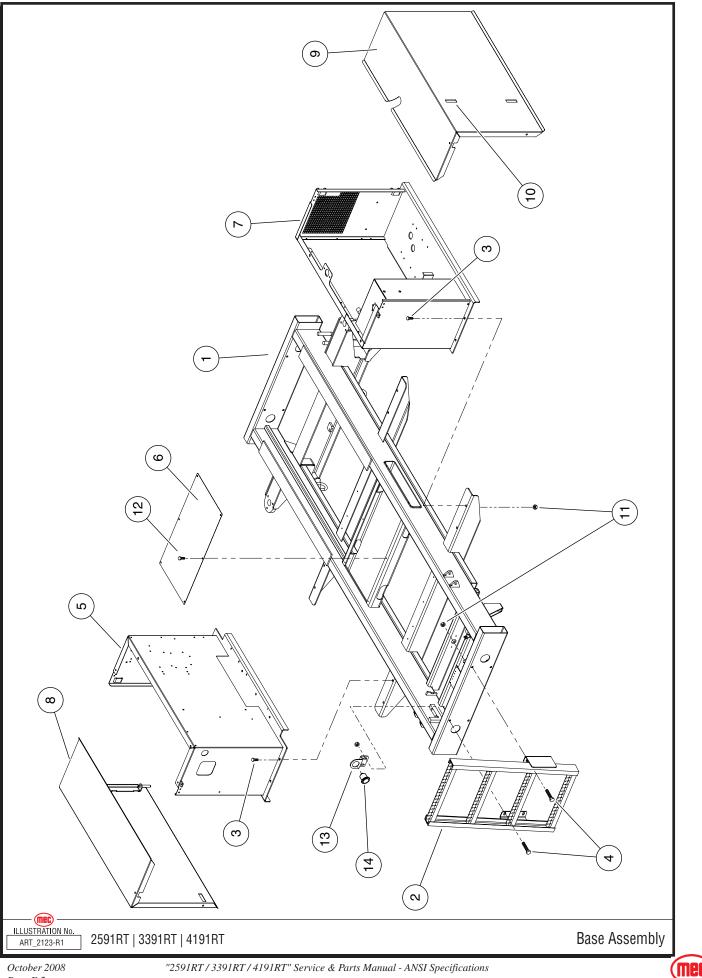
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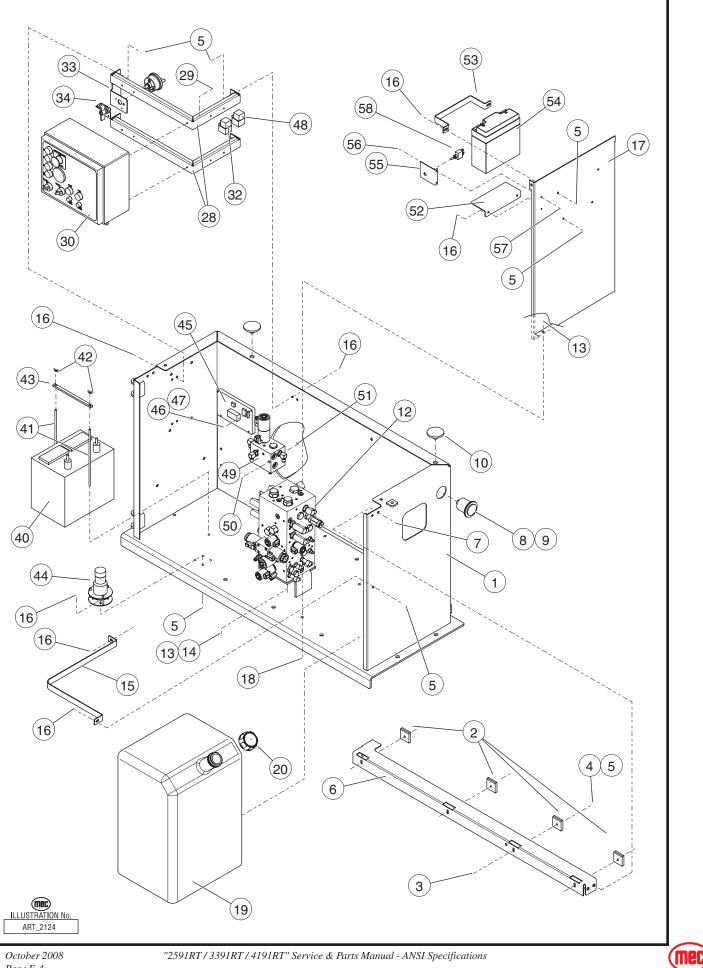


BASE ASSEMBLY F-3
Control Module
Power Module F-9
Power Module: Engine Mount - Diesel F-13
ENGINE, DUAL FUEL
ENGINE, DIESEL F-21
Wire Harness
Outrigger Installation (Option)
Generator - Option





ITEM	PART NO.	QTY	DESCRIPTION
			BASE ASSEMBLY
1	16410	1	BASE WELDMENT
2	16455	1	LADDER WELDMENT, 2591RT
	16454	1	LADDER WELDMENT, 3391RT
	16453	1	LADDER WELDMENT, 4191RT
3	HDW6211	8	SCREW, ½-13, 1 ¼" LG, GR5
4	HDW8498	4	SCREW, ¼-13, 4" LG GR5
5	16153	1	CABINET WELDMENT, CONTROL MODULE
6	16480	1	COVER, HOSE TRAY
7	16213	1	CABINET WELDMENT, POWER MODULE
8	16156	1	DOOR WELDMENT, CONTROL MODULE
9	16220	1	DOOR WELDMENT, POWER MODULE
10	8386	4	CATCH TRIGGER
11	HDW8457	12	NUT, ½" - 13, GR 5
12	HDW5723	6	SCREW, ¼–20 × ¾"
13	16834	1	BRACKET, POWER TO PLATFORM
14	90749	1	RECEPTICAL, POWER TO PLATFORM

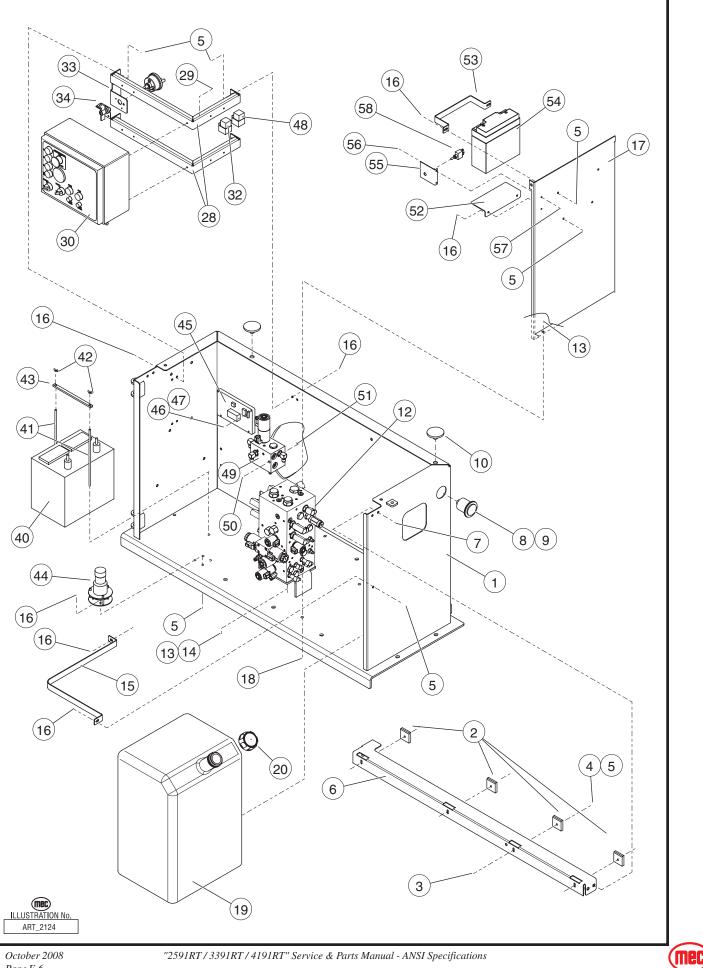


October 2008 Page F-4

"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications

ITEM	PART NO.	QTY	DESCRIPTION
			Control Module
1	16153	1	CONTROL MODULE WELDMENT
2	14896	4	BLOCK, SLIDE, DOOR
3	HDW8273	4	SCREW, ¼–20, 1" LG
4	HDW5217	4	WASHER, .343 ID \times .680 OD \times .063 THK
5	HDW8267	18	NUT, ¼–20, GR 5
6	16154	1	BRACKET, CROSS SUPPORT
7	HDW5724	4	SCREW, 5/16–18, ¾" LG, GR 5
8	90749	1	POWER TO PLATFORM (EARLY MODELS)
			(SEE PAGE F-3 FOR CURRENT CONFIGURATION)
10	25429	2	PAD
12	91410	1	HYDRAULIC MANIFOLD
13	HDW6433	4	SCREW, 3/8 × 1"
14	HDW7783	4	LOCK WASHER, 3/8
15	16225	1	BRACKET, FUEL TANK
16	HDW5723	18	SCREW, 1⁄4-20 × 3⁄4"
17	16152	1	BULKHEAD
18	HDW8268	5	NUT, 3/8
19	91023	1	FUEL TANK, PLASTIC
20	91091	1	FUEL TANK CAP
	6919	1	FUEL SHUTOFF (NOT SHOWN)
	HDW91279	1	ADAPTER, MALE 1/8 NPT, 5/16 HOSE BARB (NOT SHOWN)
	7788	1	CLAMP (NOT SHOWN)
	6458	90"	HOSE, FUEL LINE (NOT SHOWN)
	HDW91233	1	PLUG (DUAL FUEL) 1/8 NPT, 3/19 HOSE BARB (NOT SHOWN)
	HDW91320	1	ADAPTER (DIESEL)
28	16226	2	BRACKET, CONTROL BOX
29	HDW7888	4	SCREW, 10-32 × 1/2"
30	91169	1	LOWER CONTROL BOX
	91170	1	HARNESS, MAIN (NOT SHOWN)
32	91375	1	RELAY, SPEED/TORQUE, DRIVE
			CONTINUED

"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

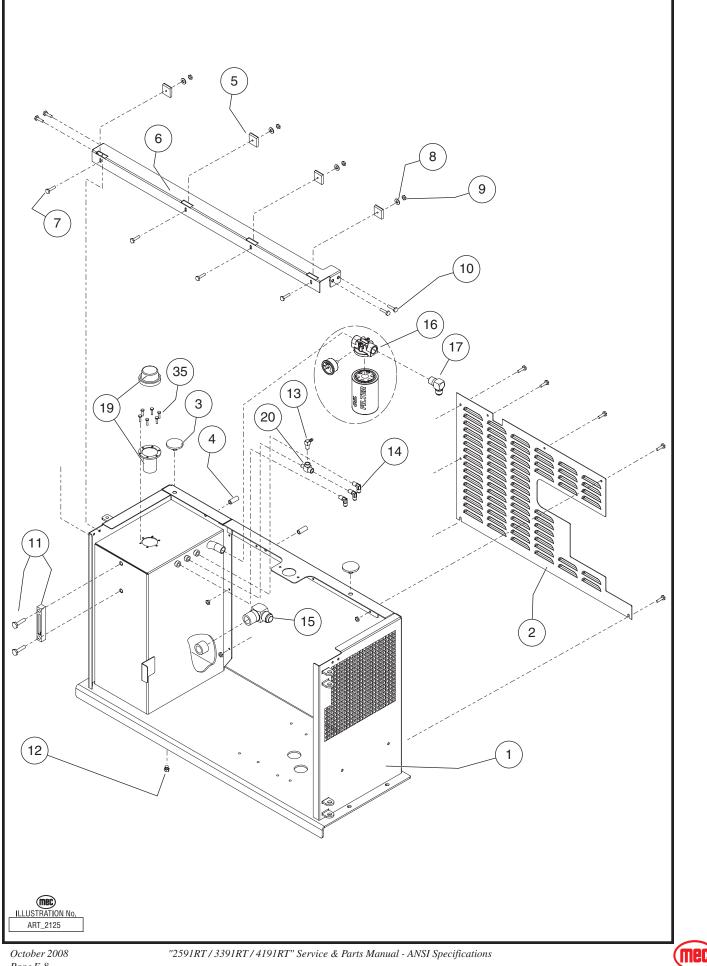


October 2008 Page F-6

"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications

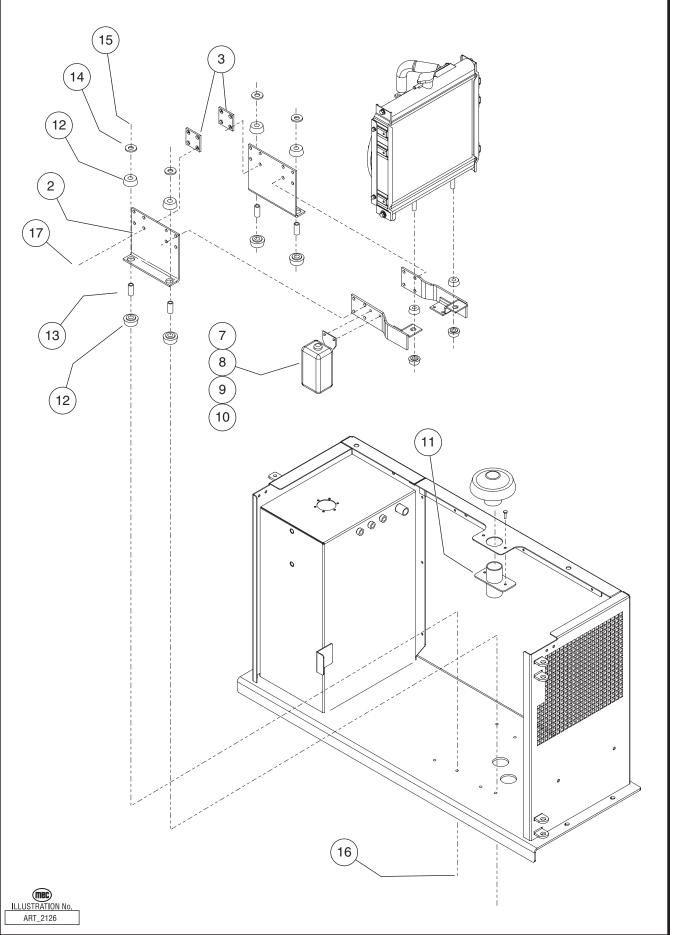
ITEM	PART NO.	QTY	DESCRIPTION
			CONTROL MODULE CONTINUED
33	16229	1	BATTERY DISCONNECT BRACKET
34	8841	1	BATTERY DISCONNECT
	9438	1	BATTERY CABLE, RED, 15 INCH LONG (NOT SHOWN)
	9012	1	BATTERY CABLE, RED, 72 INCH LONG (NOT SHOWN)
	9013	1	BATTERY CABLE, BLACK, 72 INCH LONG (NOT SHOWN)
	7172	1	BOOT, BLACK (NOT SHOWN)
	7173	1	BOOT, RED (NOT SHOWN)
40	6854	1	BATTERY, 12VDC
41	2987	2	HOLD DOWN ROD
42	HDW6110	2	WING NUT
43	3436	1	HOLD DOWN BAR
44	91174	1	LEVEL SENSOR
			OUTRIGGER OPTION
45	91280	1	CONTROL MODULE (OUTRIGGER OPTION)
46	HDW90880	4	SCREW, 10-32 × 1"
47	HDW90803	4	NUT, 10-32 NYLOCK
48	91375	1	RELAY (OUTRIGGER OPTION)
49	91268	1	OUTRIGGER MANIFOLD, (OPTION)
50	HDW91332	2	SCREW, 5/16-18 × 3½"
51	HDW8304	2	NUT, 5/15-18
			4191RT EMERGENCY LOWERING
52	16620	1	BATTERY SHELF
53	16619	1	BATTERY BRACKET
54	90898	1	BATTERY, 12VDC
55	25480	1	BRACKET, EMERGENCY DOWN SWITCH
56	HDW90833	2	SCREW, 6–32 × ¾" LG
57	HDW5364	2	NUT, 6 –32
58	7423	1	SWITCH, TOGGLE, 1 POLE 2 POS
	91378	1	HARNESS, E-DOWN TO BATTERIES (NOT SHOWN)
	91379	1	HARNESS, E-DOWN W/DIODE (NOT SHOWN)







ITEM	PART NO.	QTY	DESCRIPTION
			Power Module
1	16213	REF	WELDMENT, POWER MODULE
2	16247	1	GUARD, ENGINE MODULE
3	25429	2	PAD
4	40620	2	SPACER, INSULATOR, 1.59" LG
5	14896	4	BLOCK, SLIDE, DOOR
6	14826	1	BRACKET, CROSS SUPPORT
7	HDW8273	4	SCREW, ¼–20, 1" LG
8	HDW5217	4	WASHER, .343 ID × .680 OD × .063 THK
9	HDW8267	4	NUT, ¼–20, GR 5
10	HDW5724	4	SCREW, 5/16–18, ¾" LG, GR 5
			HYDRAULIC TANK INSTALLATION
11	9370	1	LEVEL GAUGE
12	HDW9200	1	PLUG, ¼ NPT
13	HDW6727	1	ELBOW, 90° ¼ NPT – 5/16 BARB
14	HDW7500	3	ELBOW, 90° ¼ NPT – 3/8 JIC
15	91164	1	ELBOW, 90° 1 1/8 NPT – 1 JIC
16	91417	1	FILTER ASSEMBLY (INCLUDES 91418 AND 91570)
	91418	1	FILTER CARTRIDGE
	91570	1	FILTER PRESSURE GAUGE
17	HDW9268	1	ELBOW, 90° ¾ NPT – ¾ JIC
18	HDW9268	6	BOLT, 32 × 1.57
19	9367	1	FILLER/STRAINER
20	6655	1	TEE, ¼ NPT

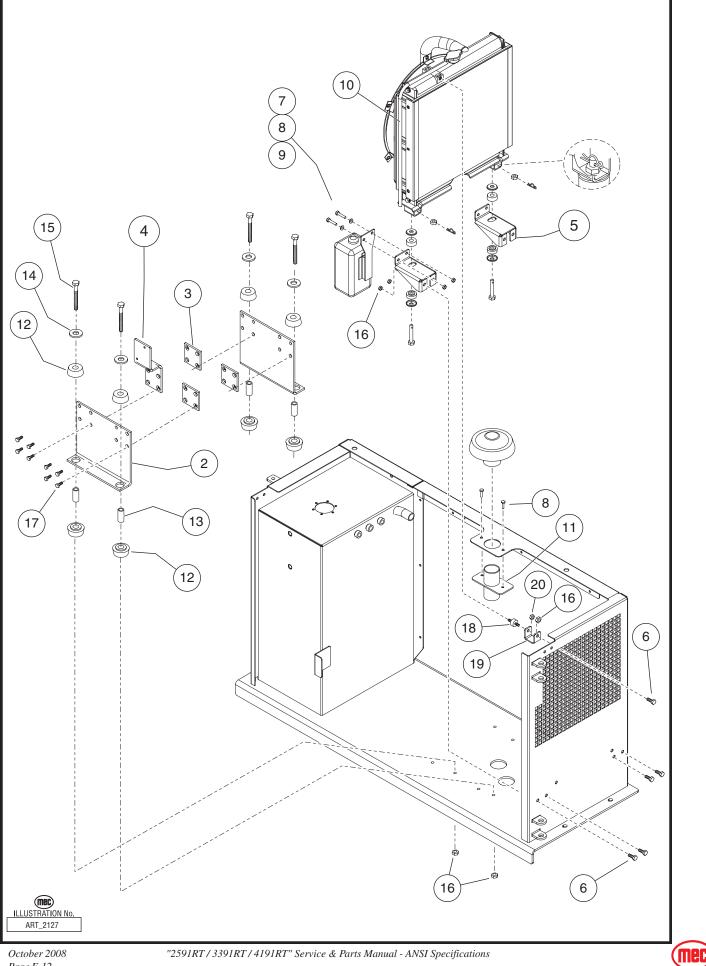




"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications



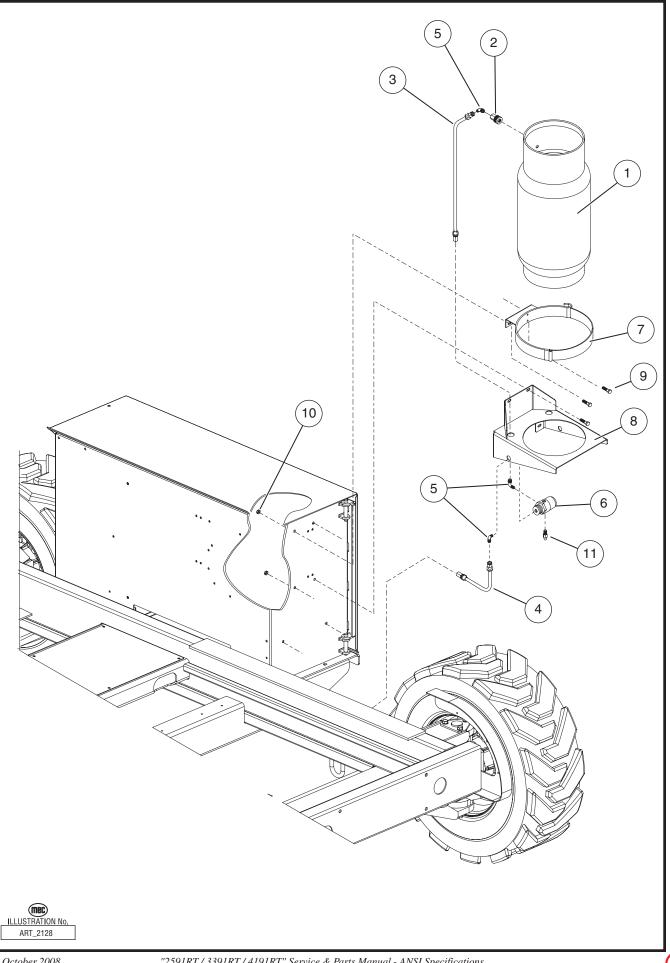
ITEM	PART NO.	QTY	DESCRIPTION
			Power Module: Engine Mount - Dual Fuel
2	16211	2	ENGINE MOUNT, DUAL FUEL
3	16210	2	SPACER
6	91131	1	RADIATOR BRACKET KIT
7	91127	1	COOLANT OVERFLOW TANK
8	HDW5723	2	SCREW, 1⁄4-20 × 3⁄4
9	HDW8267	2	NUT, ¼-20
10	6458	3 FT	HOSE
11	16295	1	AIR INTAKE WELDMENT
	HDW5723	2	SCREW, 1⁄4-20 × 3⁄4"
	HDW8267	4	NUT, ¼–20, GR 5
12	7736	8	INSULATOR RUBBER
13	40620	4	SPACER ISOLATOR
14	HDW8567	4	WASHER, 3/8 FLAT
15	HDW8279	4	SCREW, 3/8-16 × 2 ½ GR8
16	HDW8268	4	NUT, 3/8-16
17	HDW91234	12	SCREW, M10-1.25 × 25 8.8





"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

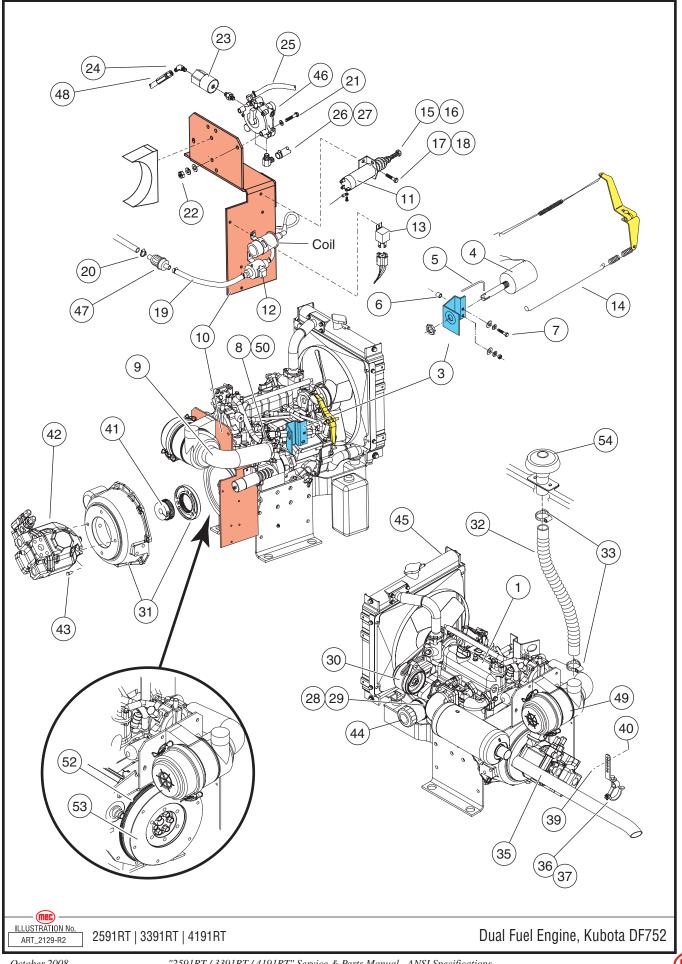
ITEM	PART NO.	QTY	DESCRIPTION
			Power Module: Engine Mount - Diesel
			Engine components found later in this section
2	16209	2	ENGINE MOUNT, DIESEL
3	16210	3	SPACER
4	16207	1	BRACKET, SOLENOID MOUNT
5	16345	2	RADIATOR MOUNT BRACKET
6	HDW6432	5	SCREW, 3/8 - 18 × ¾
7	91127	1	COOLANT OVERFLOW TANK
8	HDW5723	4	SCREW, 1⁄4-20 × 3⁄4
9	HDW8267	2	NUT, ¼-20
10	6458	3 FT	HOSE
11	16295	1	AIR INTAKE WELDMENT
12	7736	8	INSULATOR RUBBER
13	40620	4	SPACER ISOLATOR
14	HDW8567	4	WASHER, 3/8 FLAT
15	HDW8279	4	SCREW, 3/8-16 × 2 ½ GR8
16	HDW8268	9	NUT, 3/8-16
17	HDW91234	12	SCREW, M10-1.25 × 25 8.8
18	91591	1	VIBRATION ISOLATOR
19	16346	1	RADIATOR BRACE
20	945407	1	NUT, M6 × 1



October 2008 Page F-14

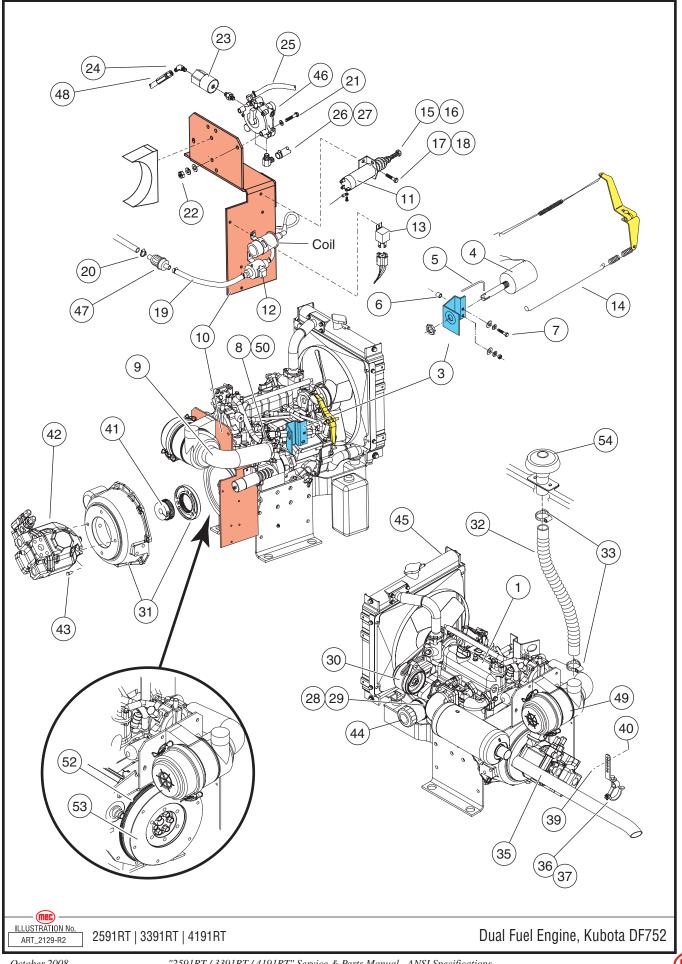


ITEM	PART NO.	QTY	DESCRIPTION
			LP TANK INSTALLATION, DUAL FUEL
1	6859	1	LP TANK
2	6868	1	QUICK DISCONNECT
3	6890	1	HOSE ASSEMBLY, 30"
4	7406	1	HOSE ASSEMBLY, 90"
5	HDW6894	3	ELBOW, BRASS, NPT TO SAE
6	6861	1	BULKHEAD FILTER
7	6860	1	BRACKET, TANK MOUNT
8	16246	1	TANK SUPPORT WELDMENT
9	HDW6433	6	SCREW, 3/8-16 × 1"
10	HDW8268	6	LOCKNUT, 3/8
11	6938	1	RELIEF VALVE
L			
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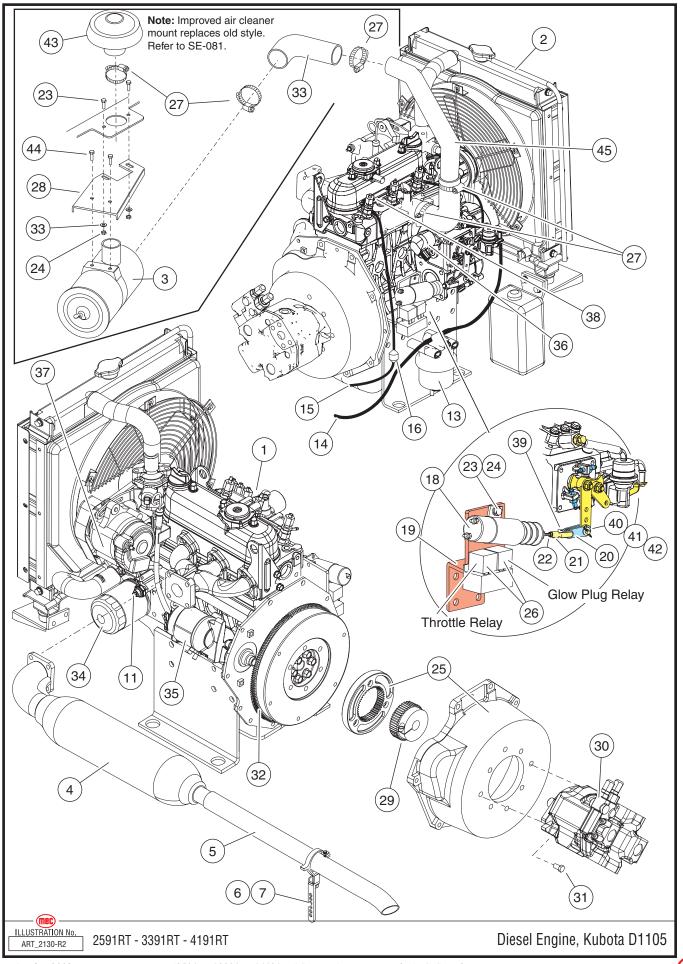


ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DUAL FUEL
			Additional attaching engine parts found earlier in this section
	91035	1	ENGINE SUBASSEMBLY, DUAL FUEL
1	91125	1	ENGINE, KUBOTA DF752
2	90239	1	MUFFLER
3	20212	1	CHOKE BRACKET
4	9502	1	CHOKE SOLENOID
5	9498	1	CHOKE LINKAGE
6	20204	1	SPACER
7	HDW91283	1	SCREW, M6–1.0 × 25
8	91133	1	CARBURETOR FLANGE
9	91188	1	INTAKE HOSE
10	21020	1	BRACKET, COMPONENTS
11	91119	1	SOLENOID, THROTTLE
12	91177	1	FUEL PUMP
13	91375	1	RELAY, THROTTLE
14	9252	1	THROTTLE LINKAGE
15	HDW9247	1	SCREW, CAP SOCKET HEAD, 1/4–28 × 1.0"
16	HDW91231	2	JAMNUT, ¼–28
17	HDW5723	6	SCREW, ¼-20 × ¾"
18	HDW8267	6	NUT, ¼–20
19	6458	REF	HOSE, FUEL, 5/16
20	7788	5	HOSE CLAMP, 5/16
21	HDW8303	2	SCREW, 5/16–18 × 2
22	HDW8304	2	NUT, 5/16–20
23	91132	1	VALVE, LOCKOFF
24	HDW6894	1	ELBOW, 90° BRASS
25	91197	10 IN	LP HOSE, 1/2"
26	91198	60 IN	RADIATOR HOSE, 3/8"
27	91232	6	HOSE CLAMP, #8
28	91175	1	OIL PRESSURE SWITCH
29	HDW91187	1	FITTING, 1/8 NPT, M-F
30	90227	1	ALTERNATOR, 40 AMP
			CONTINUED



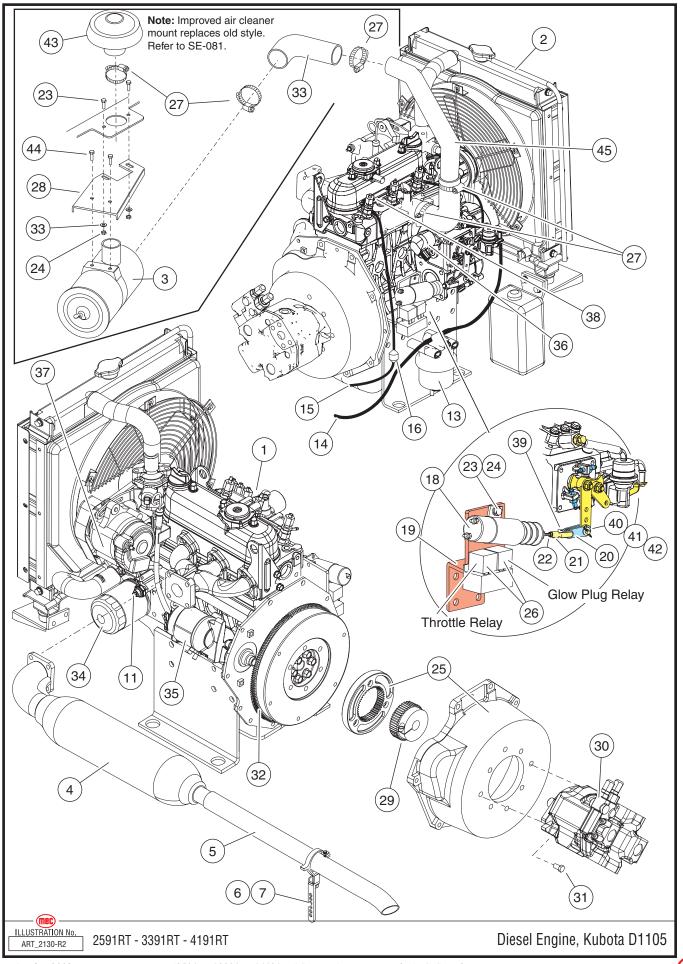


ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DUAL FUEL (CONTINUED)
31	91129	1	KTR HOUSING KIT, DF752
32	91340	1	HOSE, 2.00" I.D. FLEX
33	7545	2	HOSE CLAMP
35	91134	1	EXHAUST PIPE
36	9696	2	MUFFLER HANGER
37	9868	2	MUFFLER CLAMP
38	40620	1	SPACER
39	HDW8279	1	SCREW, 3/8–16 × 2 ½"
40	HDW8268	1	NUT, 3/8–16
41	91130	1	HUB
42	91160	1	HYDRAULIC PUMP
43	HDW6433	2	SCREW, 3/8-16 × 1"
44	8516	1	OIL FILTER
45	8472	1	RADIATOR
46	9833	1	LPG REGULATOR
47	8514	1	FUEL FILTER
48	7406	REF	HOSE ASSEMBLY, LP
49	91136	1	AIR FILTER ELEMENT
50	91617	1	CARBURETOR ASSEMBLY
51	8365	1	STARTER (NOT SHOWN)
52	91765	1	RING GEAR
53	91766	1	FLYWHEEL
54	91799	1	BREATHER CAP





ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DIESEL
			Additional attaching engine parts found earlier in this section
	84036		ENGINE SUBASSEMBLY, DIESEL
1	91429	1	ENGINE KIT, D1105
2	91113	1	RADIATOR KIT
	9831		RADIATOR
3	91111	1	AIR CLEANER KIT
	8667		AIR FILTER ELEMENT
4	91115	1	MUFFLER KIT
	9830		MUFFLER
5	91118	1	EXHAUST PIPE
6	9696	1	MUFFLER HANGER
7	9868	1	MUFFLER CLAMP
8	40620	1	SPACER
9	HDW8279	1	SCREW, 3/8–16 × 2 ½"
10	HDW8268	1	NUT, 3/8–16
11	91175	1	OIL PRESSURE SWITCH
12	HDW91187	1	FITTING, 1/8 NPT, M–F
13	91116	1	FUEL FILTER ASSEMBLY
	91123		FUEL FILTER ELEMENT
14	6458	8 FT	HOSE, FUEL, 5/16
15	91199	6 FT	HOSE, FUEL, 3/16
16	91114	1	VALVE, CHECK
17	7788	5	HOSE CLAMP
18	91589	1	SOLENOID, THROTTLE
19	16207	1	BRACKET, SOLENOID
20	16347	2	THROTTLE LINK
21	91117	1	YOKE
22	HDW91231	1	JAMNUT, ¼–28
23	HDW5723	4	SCREW, ¼–20 × ¾"
24	HDW8267	4	NUT, ¼–20
25	91112	1	KTR HOUSING KIT, D905
			CONTINUED





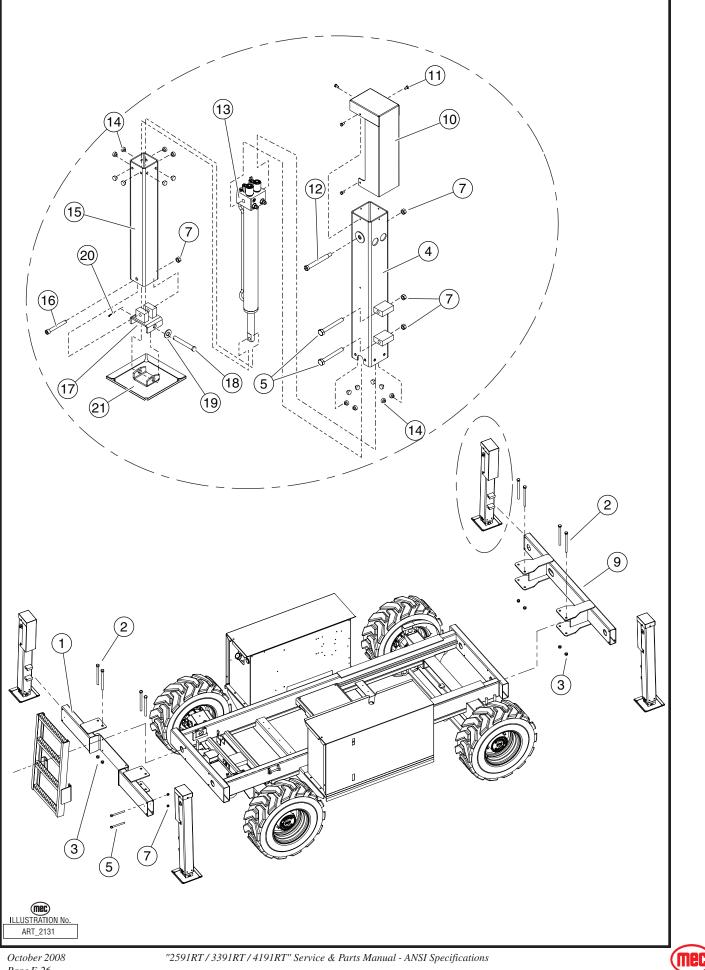
ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DIESEL (CONTINUED)
26	91375	2	RELAY
27	7545	5	HOSE CLAMP
28	16720	1	BRACKET
29	91130	1	HUB
30	91160	1	HYDRAULIC PUMP
31	HDW6433	2	SCREW, 3/8-16 × 1"
32	91630	1	RING GEAR
33	HDW5217	2	FLAT WASHER
34	8665	-	OIL FILTER
35	8413	-	STARTER
36	8001	-	FUEL SOLENOID
37	90227	-	ALTERNATOR
38	9832	-	GLOW PLUGS
39	91588	1	WASHER, ¼" RUBBER
40	HDW5217	1	WASHER, FLAT, 5/16"
41	HDW91590	1	CLEVIS PIN, $5/16 \times 1$ "
42	HDW5290	1	COTTER PIN, 1/8" × 1"
43	91799	1	BREATHER CAP
44	946640	2	SCREW,
45	16721	1	TUBE, INTAKE EXTENSION

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ITEM	PART NO.	QTY	DESCRIPTION
			Wire Harness
-	91430		HARNESS, MAIN [CONTROL MODULE - BASE & VALVES]
	91185		CONTROL CABLE, 2591RT
	91321		CONTROL CABLE, 3391RT
	91439		CONTROL CABLE, 4191RT
			[CONTROL MODULE TO DECK THROUGH SCISSOR BEAMS]
—	91184		HARNESS, CONTROL BOX (UPPER)
			[INSIDE UPPER CONTROL BOX]
—	91294		CABLE, OUTRIGGER OPTION, UPPER CONTROLS
			[INSIDE UPPER CONTROL BOX]
—	91295		CABLE, OUTRIGGER OPTION, CONTROL, PLATFORM
			[DECK TO UPPER CONTROL BOX]
—	91296		CABLE, OUTRIGGER OPTION, CONTROL, 2591RT
	91121		CABLE, OUTRIGGER OPTION, CONTROL, 3391RT
	91447		CABLE, OUTRIGGER OPTION, CONTROL, 4191RT
			[CONTROL MODULE TO DECK THROUGH SCISSOR BEAMS]
—	91444		HARNESS, OUTRIGGER OPTION
			[CONTROL MODULE TO OUTRIGGERS]
	91448		HARNESS, LIFT CYLINDER DOWN VALVE, 2591RT, 3391RT
			[CONTROL MODULE TO LIFT CYLINDER]
-	91440		HARNESS, LOWER LIFT CYLINDER DOWN VALVE, 4191RT
			[CONTROL MODULE TO LIFT CYLINDER]
-	91441		HARNESS, UPPER LIFT CYLINDER DOWN VALVE , 4191RT
			[CONTROL MODULE TO LIFT CYLINDER]
-	91379		HARNESS, E-DOWN WITH DIODE, 4191RT
	91378		HARNESS, E-DOWN TO BATTERIES, 4191RT
	91171		HARNESS, ENGINE, INTERMEDIATE
			[CONTROL MODULE TO ENGINE MODULE]
-	91543		HARNESS, ENGINE INTERMEDIATE, GENERATOR OPTION
			[CONTROL MODULE TO ENGINE MODULE]
-	91172		HARNESS, ENGINE, DUAL FUEL [ENGINE MODULE]
	91173		HARNESS, ENGINE, DIESEL [ENGINE MODULE]
-	91189		CABLE, UPPER CONTROLS, REMOVABLE
	91557		CABLE, UPPER CONTROLS, FIXED
-	91595		HARNESS, LOWER CONTROLS
			[INSIDE LOWER CONTROL BOX]

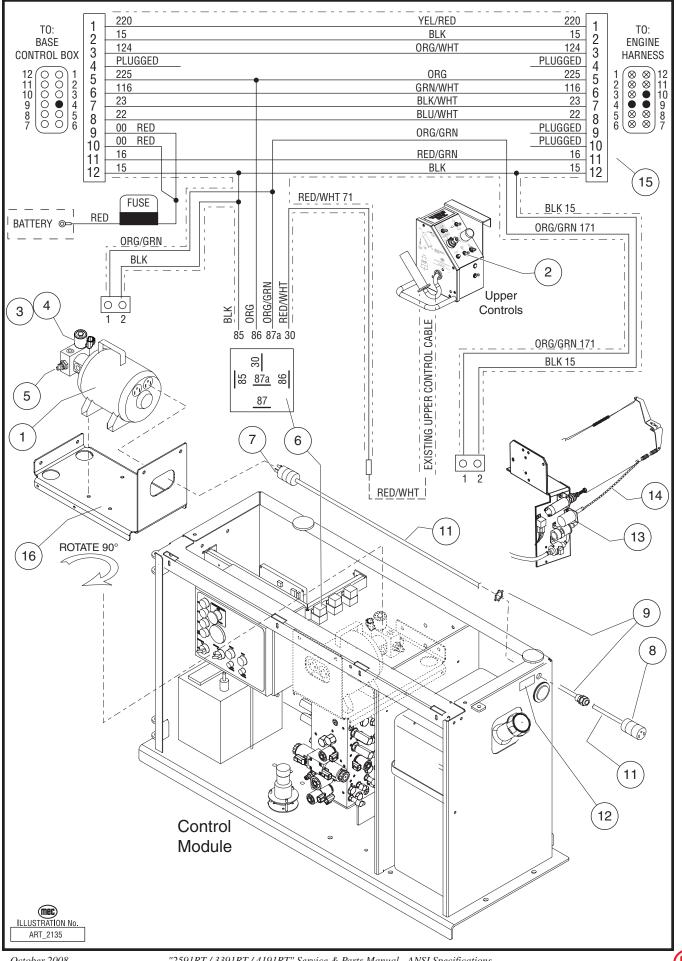
"2591RT/3391RT/4191RT" Service & Parts Manual - ANSI Specifications





"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

ITEM	PART NO.	QTY	DESCRIPTION
			OUTRIGGER INSTALLATION (OPTION)
1	16490	1	WELDMENT, OUTRIGGER MOUNT, REAR
2	HDW91457	8	SCREW, ¾–10 × 10" LG
3	HDW91458	8	LOCKNUT, ¾–10
4	16451	4	WELDMENT, OUTER OUTRIGGER
5	HDW7052	8	SCREW, ½–13 × 3 ½" LG
7	HDW8457	16	NUT, ½–13
9	16491	1	WELDMENT, OUTRIGGER MOUNT, FRONT
10	21170	4	COVER, OUTRIGGER CYLINDER
11	HDW6455	20	SCREW, 1⁄4–20 × 1⁄2"
12	HDW91328	4	SHOULDER SCREW, $5/8 \times 4.75$ "
13	91443	4	CYLINDER, OUTRIGGER
14	90663	64	SPACER
15	16448	4	TUBE, INNER OUTRIGGER
16	HDW5916	4	SCREW, ½–13 × 4.0"
17	20998	4	BRACKET PIVOT
18	HDW91395	4	CLEVIS PIN, 5/8 × 5.0"
19	HDW9219	4	WASHER, FLAT
20	HDW5920	4	PIN, COTTER, 1/8 × 1"
21	21002	4	PAD WELDMENT





"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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ITEM	PART NO.	QTY	DESCRIPTION
			GENERATOR - OPTION
			REFER TO SECTION 5 FOR HOSE KIT
1	91550	1	GENERATOR, 2000 WATT
2	5630	1	SWITCH, TOGGLE
3	91551	1	VALVE, SOLENOID, 2-WAY, N.C.
4	91002	1	COIL, 12V 10 SERIES
5	91546	1	NEEDLE VALVE
6	91375	1	RELAY, SPDT
7	91544	1	PLUG, MALE, 3 PRONG
8	91545	2	RECEPTACLE, FEMALE
9	7594	1	STRAIN RELIEF
		1	LOCKNUT, ½" NPT
11	7617	6 FT	WIRE, 14GA, 3 CONDUCTOR
12	91556	1	LABEL, AC GENERATOR
13	9502	1	SOLENOID, GENERATOR-THROTTLE, GAS ENGINE
	91119	1	SOLENOID, GENERATOR-THROTTLE, DIESEL ENGINE
14	91469	2 FT	CHAIN, SASH #8
15	91543	1	HARNESS, ENGINE INTERMEDIATE, GENERATOR OPTION
16	16369	1	BRACKET, GENERATOR MOUNT
L			

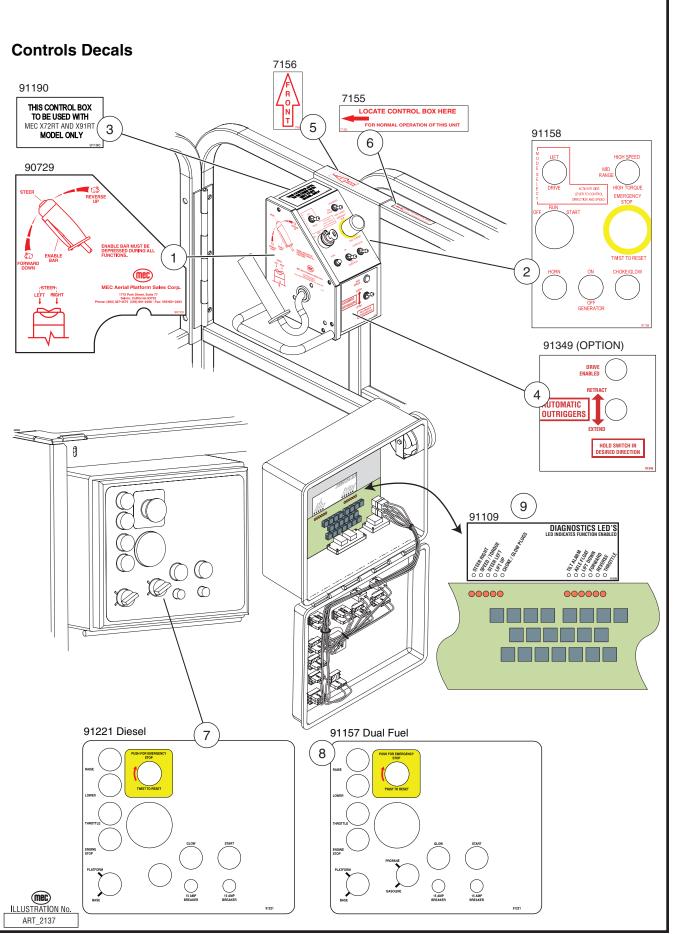
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	HORAGE POINTS OPTION	
,	RIGGER OPTION	
)	"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications	October 2008 Page G-1

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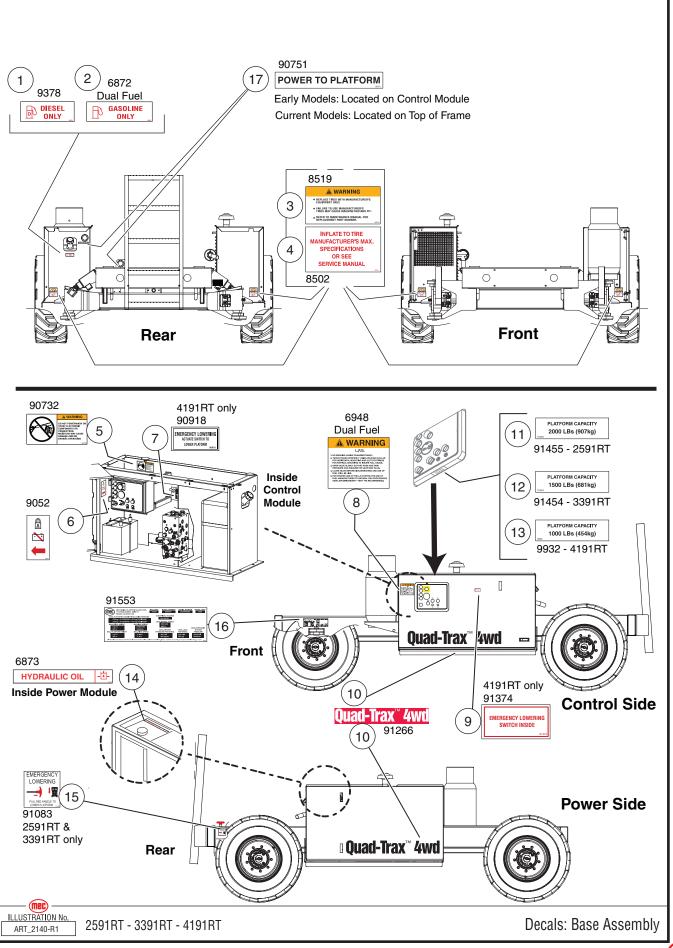


October 2008 Page G-2

"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

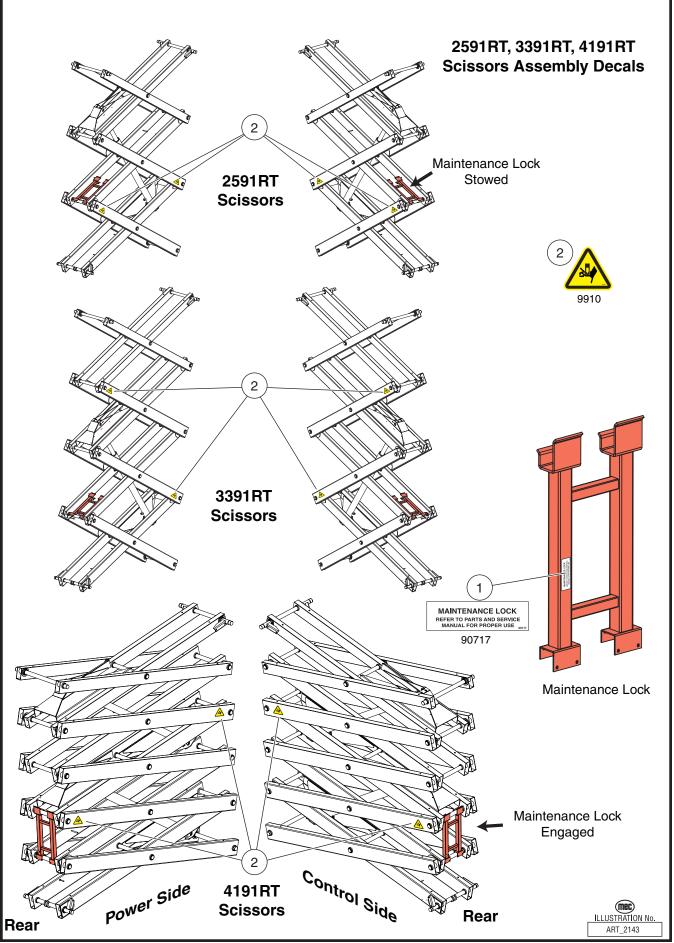


ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, CONTROLS
1	90729	1	DECAL, UPPER CONTROL BOX, SIDE
2	91158	1	DECAL, UPPER CONTROLS
3	91190	1	DECAL, CONTROL BOX MODEL
4	91349	1	DECAL, OUTRIGGER CONTROLS
5	7156	1	DECAL, FRONT
6	7155	1	DECAL, LOCATE CONTROL BOX HERE
7	91221	1	DECAL, LOWER CONTROLS, DIESEL
8	91157	1	DECAL, LOWER CONTROLS, DUAL FUEL
9	91109	1	DIAGNOSTIC LABEL





ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, BASE
1	9378	1	DECAL, DIESEL ONLY
2	6872	1	DECAL, GASOLINE ONLY
3	8519	4	DECAL, WARNING, TIRE REPLACEMENT
4	8502	4	DECAL, INFLATE TIRE
5	90732	1	DECAL, WARNING, PRESSURE WASH
6	9052	1	DECAL, BATTERY DISCONNECT AND LOCK
7	90918	1	DECAL, EMERGENCY LOWERING SWITCH, 4191RT
8	6948	1	WARNING, LPG, DUAL FUEL ONLY
9	91374	1	DECAL, EMERGENCY LOWERING SWITCH INSIDE, 4191RT
10	91266	2	DECAL, QUAD TRAX 4WD
11	91455	1	DECAL, PLATFORM CAPACITY, SMALL, 2591RT
12	91454	1	DECAL, PLATFORM CAPACITY, SMALL, 3391RT
13	9932	1	DECAL, PLATFORM CAPACITY, SMALL, 4191RT
14	6873	1	DECAL, HYDRAULIC OIL
15	91083	1	EMERGENCY LOWERING, 2591RT, 3391RT
16	91553	1	SERIAL PLATE
17	90751	1	POWER TO PLATFORM

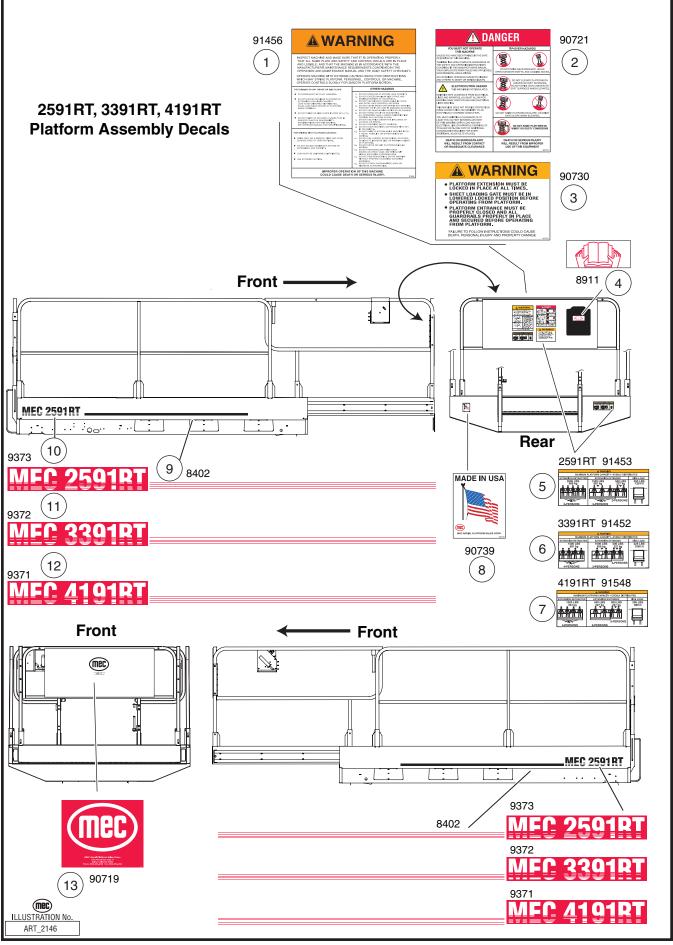




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ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, SCISSORS
1	90717	1	DECAL, MAINTENANCE LOCK
2	9910	4	DECAL, PINCH POINT
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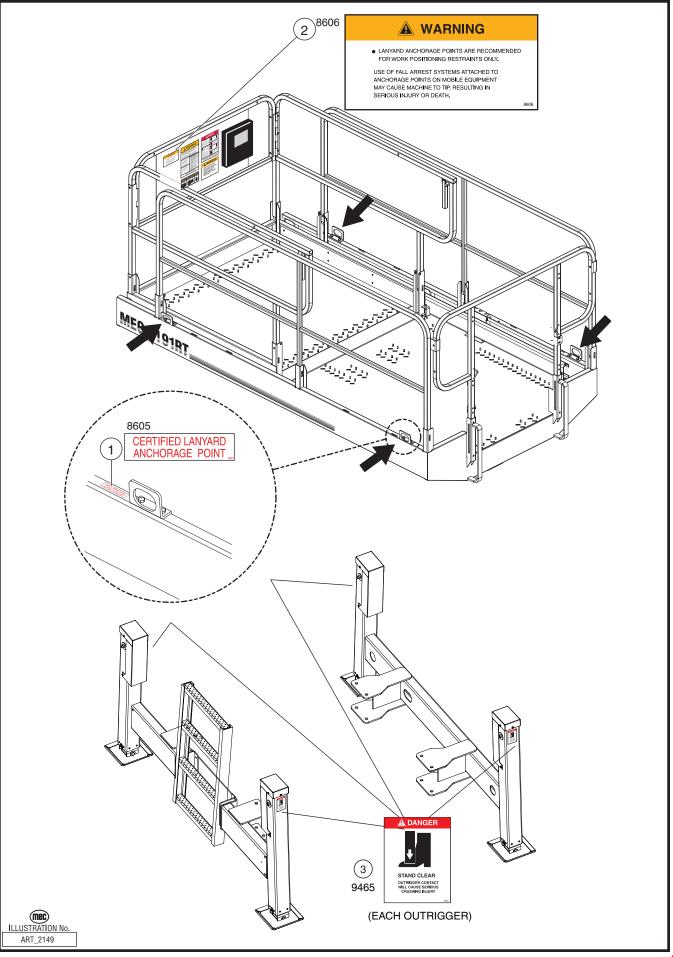


October 2008 Page G-8

"2591RT / 3391RT / 4191RT" Service & Parts Manual - ANSI Specifications

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Image: Market State	ITEM	PART NO.	QTY	DESCRIPTION
2 90721 1 DECAL, DANGER, ELECTRIC - TIPOVER - WIND RATING 3 90730 1 DECAL, WARNING, SHEET LOADING 4 8911 1 DECAL, WARNING, SHEET LOADING 5 91453 2 DECAL, MANUAL CASE 6 91452 2 DECAL, CAPACITY, 2000 LB, 2591RT 6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT				DECAL KIT, PLATFORM
2 90721 1 DECAL, DANGER, ELECTRIC - TIPOVER - WIND RATING 3 90730 1 DECAL, WARNING, SHEET LOADING 4 8911 1 DECAL, WARNING, SHEET LOADING 5 91453 2 DECAL, MANUAL CASE 6 91452 2 DECAL, CAPACITY, 2000 LB, 2591RT 6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT				
3 90730 1 DECAL, WARNING, SHEET LOADING 4 8911 1 DECAL, MANUAL CASE 5 91453 2 DECAL, CAPACITY, 2000 LB, 2591RT 6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	1	91456	1	DECAL, WARNING PANEL
4 8911 1 DECAL, MANUAL CASE 5 91453 2 DECAL, CAPACITY, 2000 LB, 2591RT 6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	2	90721	1	DECAL, DANGER, ELECTRIC - TIPOVER - WIND RATING
5 91453 2 DECAL, CAPACITY, 2000 LB, 2591RT 6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	3	90730	1	DECAL, WARNING, SHEET LOADING
6 91452 2 DECAL, CAPACITY, 1500 LB, 3391RT 7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	4	8911	1	DECAL, MANUAL CASE
7 91548 2 DECAL, CAPACITY, 1000 LB, 4191RT 8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	5	91453	2	DECAL, CAPACITY, 2000 LB, 2591RT
8 90739 1 DECAL, MADE IN USA 9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	6	91452	2	DECAL, CAPACITY, 1500 LB, 3391RT
9 8402 2 DECAL, RAIL STRIPE 10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	7	91548	2	DECAL, CAPACITY, 1000 LB, 4191RT
10 9373 2 DECAL, MEC 2591RT 11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	8	90739	1	DECAL, MADE IN USA
11 9372 2 DECAL, MEC 3391RT 12 9371 2 DECAL, MEC 44191RT	9	8402	2	DECAL, RAIL STRIPE
12 9371 2 DECAL, MEC 44191RT	10	9373	2	DECAL, MEC 2591RT
	11	9372	2	DECAL, MEC 3391RT
13 90719 1 DECAL, MEC OVAL I I I	12	9371	2	DECAL, MEC 44191RT
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ITEM	PART NO.	QTY	DESCRIPTION	
			DECAL KIT, ANCHORAGE POINTS OPTION	
1	8605	4	CERTIFIED LANYARD ANCHORAGE POINT	
2	8506	1	DECAL, WARNING, POS RESTRAINTS	
			DECAL KIT, OUTRIGGER OPTION	
1	9465	4	DECAL, DANGER, KEEP CLEAR OUTRIGGERS	
				
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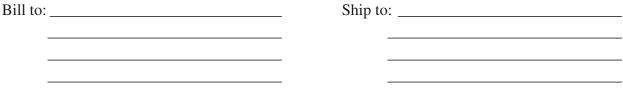
Ordered By: _____

Your Fax No.: _____

Please fill out completely

Date:

Account: _____



Purchase Order Number ____

**All orders <u>MUST</u> have a Purchase Order Number

Ship VIA _____

**Fed Ex shipments require Fed Ex account number

Part Number	Description	Quantity	Price

All backordered parts will be shipped when available via the same ship method as original order unless noted below:

- Ship complete order only no backorders •
- Ship all available parts and contact customer on disposition of backordered parts
- other (please specify) •

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Limited Owner Warranty

MEC Aerial Platform Sales Corp. warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC Aerial Platform Sales Corp. further warrants the structural weldments of the main frame and scissor arms to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchase date. Warranty claims within such warranty period shall be limited to repair or replacement, MEC Aerial Platform Sales Corp's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC Aerial Platform Sales Corp's then current flat rate, provided the defective part in question is shipped prepaid to MEC Aerial Platform Sales Corp. and is found upon inspection by MEC Aerial Platform Sales Corp. to be defective in material and/or workmanship. MEC Aerial Platform Sales Corp. shall not be liable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts; misuse, improper maintenance, or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose, are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC Aerial Platform Sales Corp. is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC Aerial Platform Sales Corp. any liability or obligation which exceeds MEC Aerial Platform Sales Corp's obligations under this warranty.



Aerial Platforms Sales Corp.

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